

NATIONAL PROGRAM FOR INSPECTION OF NON-FEDERAL DAMS
LEVERETT POND (MA 005.) (U) CORPS OF ENGINEERS WALTHAM
MA NEW ENGLAND DIV MAR 79

UNCLASSIFIED

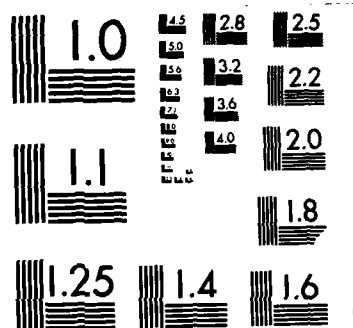
F/G 13/13

NL

END

FILM 451

9T1c



MICROCOPY RESOLUTION TEST CHART
NATIONAL BUREAU OF STANDARDS-1963-A

AD-A156 162

(2)

CONNECTICUT RIVER BASIN
LEVERETT, MASSACHUSETTS

LEVERETT POND
MA 00525

PHASE I INSPECTION REPORT
NATIONAL DAM INSPECTION PROGRAM



DTIC
ELECTE
JUN 2 0 1985
G

DEPARTMENT OF THE ARMY
NEW ENGLAND DIVISION, CORPS OF ENGINEERS
WALTHAM, MASS. 02154

DISTRIBUTION STATEMENT A
Approved for public release;
Distribution Unlimited

DTIC FILE COPY

MARCH 1979

85 5 28 026

UNCLASSIFIED

SECURITY CLASSIFICATION OF THIS PAGE (When Data Entered)

REPORT DOCUMENTATION PAGE		READ INSTRUCTIONS BEFORE COMPLETING FORM
1. REPORT NUMBER MA 00525	2. GOVT ACCESSION NO.	3. RECIPIENT'S CATALOG NUMBER
4. TITLE (and Subtitle) Leverett Pond NATIONAL PROGRAM FOR INSPECTION OF NON-FEDERAL DAMS		5. TYPE OF REPORT & PERIOD COVERED INSPECTION REPORT
7. AUTHOR(s) U.S. ARMY CORPS OF ENGINEERS NEW ENGLAND DIVISION		6. PERFORMING ORG. REPORT NUMBER
9. PERFORMING ORGANIZATION NAME AND ADDRESS		8. CONTRACT OR GRANT NUMBER(s)
11. CONTROLLING OFFICE NAME AND ADDRESS DEPT. OF THE ARMY, CORPS OF ENGINEERS NEW ENGLAND DIVISION, NEDED 424 TRAPELO ROAD, WALTHAM, MA. 02254		10. PROGRAM ELEMENT, PROJECT, TASK AREA & WORK UNIT NUMBERS
14. MONITORING AGENCY NAME & ADDRESS (if different from Controlling Office)		12. REPORT DATE March 1979
		13. NUMBER OF PAGES 57
		15. SECURITY CLASS. (of this report) UNCLASSIFIED
		15a. DECLASSIFICATION/DOWNGRADING SCHEDULE
16. DISTRIBUTION STATEMENT (of this Report) APPROVAL FOR PUBLIC RELEASE: DISTRIBUTION UNLIMITED		
17. DISTRIBUTION STATEMENT (of the abstract entered in Block 20, if different from Report)		
18. SUPPLEMENTARY NOTES Cover program reads: Phase I Inspection Report, National Dam Inspection Program; however, the official title of the program is: National Program for Inspection of Non-Federal Dams; use cover date for date of report.		
19. KEY WORDS (Continue on reverse side if necessary and identify by block number) DAMS, INSPECTION, DAM SAFETY, Connecticut River Basin Leverett, Massachusetts Tributary of Doolittle Brook		
20. ABSTRACT (Continue on reverse side if necessary and identify by block number) The dam is about 15 ft. wide, 6 to 8 ft. high by 15 ft. long earthfill structure having a 2 ft. wide concrete spillway chute passing through the approximate center. It is considered to be in poor condition. The spillway chute was observed to be blocked with debris and the embankment showed indications of continual erosion at the concretefill interface. The dam in effect acts as a full width spillway.		

DISCLAIMER NOTICE

**THIS DOCUMENT IS BEST QUALITY
PRACTICABLE. THE COPY FURNISHED
TO DTIC CONTAINED A SIGNIFICANT
NUMBER OF PAGES WHICH DO NOT
REPRODUCE LEGIBLY.**



DEPARTMENT OF THE ARMY
NEW ENGLAND DIVISION, CORPS OF ENGINEERS
424 TRAPELO ROAD
WALTHAM, MASSACHUSETTS 02154

REPLY TO
ATTENTION OF
NEDED

MAY 2 1979

Honorable Edward J. King
Governor of the Commonwealth of
Massachusetts
State House
Boston, Massachusetts 02133

Dear Governor King:

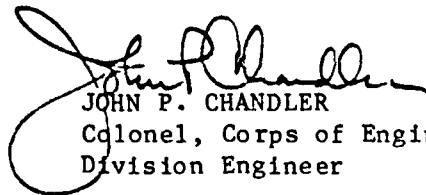
I am forwarding to you a copy of the Leverett Pond Phase I Inspection Report, which was prepared under the National Program for Inspection of Non-Federal Dams. This report is presented for your use and is based upon a visual inspection, a review of the past performance and a brief hydrological study of the dam. A brief assessment is included at the beginning of the report. I have approved the report and support the findings and recommendations described in Section 7 and ask that you keep me informed of the actions taken to implement them. This follow-up action is a vitally important part of this program.

A copy of this report has been forwarded to the Department of Environmental Quality Engineering, the cooperating agency for the Commonwealth of Massachusetts. In addition, a copy of the report has also been furnished the owner, Mrs. Lucille W. Lewis, Main Street, Wendel, Massachusetts 01379.

Copies of this report will be made available to the public, upon request, by this office under the Freedom of Information Act. In the case of this report the release date will be thirty days from the date of this letter.

I wish to take this opportunity to thank you and the Department of Environmental Quality Engineering for your cooperation in carrying out this program.

Sincerely yours,


JOHN P. CHANDLER
Colonel, Corps of Engineers
Division Engineer

Incl
As stated

NATIONAL DAM INSPECTION PROGRAM

PHASE I INVESTIGATION REPORT

BRIEF ASSESSMENT

Identification No.: MA 00525
Name of Dam: Leverett Pond
Town: Leverett
County and State: Franklin County, Massachusetts
Stream: Tributary of Doolittle Brook
Date of Inspection: November 27, 1978

The dam is an approximate 15 feet wide, 6 to 8 feet high by 15 feet long earthfill structure having a 2 foot wide concrete spillway chute passing through the approximate center. The dam is believed to have been built in the early 1900's and is presently owned by Mrs. Lucille W. Lewis of Wendell, Massachusetts.

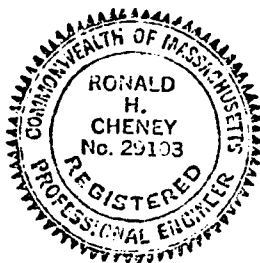
The visual inspection indicated the dam to be in poor condition. At that time, the spillway chute was observed to be blocked with debris and the embankment showed indications of continued erosion at the concrete-fill interface. Based on the small size and low hazard classifications in accordance with Corps guidelines, the test flood is the 100 year storm. The inflow from this test flood is 517 cfs. The spillway chute, in its normally operated condition, is not capable of passing the estimated resulting outflow of 15 cfs. The entire crest of the dam would then act as a spillway with water overtopping it by a depth of 0.4 feet.

Leverett Pond

This dam in effect acts as a full width spillway. As this dam is now operated, water can be expected to flow over the crest frequently. Therefore, the owner should engage a qualified engineer to design adequate repairs for the downstream eroded areas at the spillway chute and the dam embankment. These repairs should be such that future erosion will be prevented. These areas are shown in photos 1 and 2.

Remedial measures regarding operational and maintenance procedures should include removal of trees adjacent to the left wall of the spillway chute and removal of debris in the spillway chute and top of the dam.

All recommendations and remedial measures should be implemented within one year after receipt of this Phase I Inspection Report by the owner.



Ronald H. Cheney
Ronald H. Cheney, P.E.
Associate

Hayden, Harding, & Buchanan, Inc.
Boston, Massachusetts

Accession For	
NTIS GRA&I	<input checked="" type="checkbox"/>
DTIC TAB	<input type="checkbox"/>
Unannounced	<input type="checkbox"/>
Justification	
By	
Distribution/	
Availability Codes	
Dist	Avail and/or Special
A/1	23 NY

Leverett Pond

his Phase I Inspection Report on Leverett Pond Dam
has been reviewed by the undersigned Review Board members. In our
opinion, the reported findings, conclusions, and recommendations are
consistent with the Recommended Guidelines for Safety Inspection of
Dams, and with good engineering judgment and practice, and is hereby
submitted for approval.

Joseph W. Finegan
JOSEPH W. FINEGAN, JR., MEMBER
Water Control Branch
Engineering Division

Joseph A. McElroy
JOSEPH A. MCELROY, MEMBER
Foundation & Materials Branch
Engineering Division

Carney M. Terzian
CARNEY M. TERZIAN, CHAIRMAN
Chief, Structural Section
Design Branch
Engineering Division

APPROVAL RECOMMENDED:

Joe B. Fryar
JOE B. FRYAR
Chief, Engineering Division

PREFACE

This report is prepared under guidance contained in the Recommended Guidelines for Safety Inspection of Dams, for Phase I Inspections. Copies of these guidelines may be obtained from the Office of Chief of Engineers, Washington, D.C. 20314. The purpose of a Phase I Investigation is to identify expeditiously those dams which may pose hazards to human life or property. The assessment of the general condition of the dam is based upon available data and visual inspections. Detailed investigation, and analyses involving topographic mapping, subsurface investigations, testing, and detailed computational evaluations are beyond the scope of a Phase I Investigation: however, the investigation is intended to identify any need for such studies.

In reviewing this report, it should be realized that the reported condition of the dam is based on observations of field conditions at the time of inspection along with data available to the inspection team. In cases where the reservoir was lowered or drained prior to inspection, such action, while improving the stability and safety of the dam, removes the normal load on the structure and may obscure certain conditions which might otherwise be detectable if inspected under the normal operating environment of the structure.

It is important to note that the condition of a dam depends on numerous and constantly changing internal and external conditions, and is evolutionary in nature. It would be incorrect to assume that the present condition of the dam will continue to represent the condition of the dam at some point in the future. Only through continued care and inspection can there be any chance that unsafe conditions be detected.

Phase I inspections are not intended to provide detailed hydrologic and hydraulic analyses. In accordance with the established Guidelines, the Spillway Test flood is based on the estimated "Probable Maximum Flood" for the region (greatest reasonably possible storm runoff), or fractions thereof. Because of the magnitude and rarity of such a storm event, a finding that a spillway will not pass the test flood should not be interpreted as necessarily posing a highly inadequate condition. The test flood provides a measure of relative spillway capacity and serves as an aide in determining the need for more detailed hydrologic and hydraulic studies, considering the size of the dam, its general condition and the downstream damage potential.

CONTENTS

<u>Section</u>	<u>Page</u>
Letter of Transmittal	
Brief Assessment	
Review Board Page	
Preface	i
Table of Contents	iii-v
Overview Photo	vi
Location Map	vii

REPORT

1. PROJECT INFORMATION

1.1 General	1
a. Authority	1
b. Purpose of Inspection	2
1.2 Description of Project	2
a. Location	2
b. Description of Dam and Appurtenances	2
c. Size Classification	3
d. Hazard Classification	3
e. Ownership	3
f. Operator	3
g. Purpose of Dam	4
h. Design and Construction History	4
i. Normal Operating Procedures	4
1.3 Pertinent Data	4

2. ENGINEERING DATA

2.1 Design Data	9
2.2 Construction Data	9
2.3 Operation Data	9
2.4 Evaluation of Data	9

<u>Section</u>	<u>Page</u>
3. VISUAL INSPECTION	
3.1 Findings	10
a. General	10
b. Dam	10
c. Appurtenant Structures	11
d. Reservoir Area	12
e. Downstream Channel	12
3.2 Evaluation	12
4. OPERATIONAL PROCEDURES	
4.1 Procedures	13
4.2 Maintenance of Dam	13
4.3 Maintenance of Operating Facilities	13
4.4 Description of any Warning System in Effect	13
4.5 Evaluation	13
5. HYDRAULIC/HYDROLOGIC	
5.1 Evaluation of Features	15
a. General	15
b. Design Data	15
c. Experience Data	15
d. Visual Observation	15
e. Overtopping Potential	15
f. Dam Failure Analysis	16
6. STRUCTURAL STABILITY	
6.1 Evaluation of Structural Stability	17
a. Visual Observation	17
b. Design and Construction Data	17
c. Operating Records	17
d. Post-Construction Changes	17
e. Seismic Stability	17

<u>Section</u>	<u>Page</u>
7. ASSESSMENT, RECOMMENDATIONS AND REMEDIAL MEASURES	
7.1 Dam Assessment	18
a. Condition	18
b. Adequacy of Information	18
c. Urgency	18
d. Need for Additional Investigation	18
7.2 Recommendations	18
7.3 Remedial Measures	19
a. Operation and Maintenance Procedures	19
7.4 Alternatives	19

APPENDIXES

APPENDIX A - INSPECTION CHECKLIST	A-1
APPENDIX B - ENGINEERING DATA	B-1
APPENDIX C --PHOTOGRAPHS	C-1
APPENDIX D - HYDROLOGIC AND HYDRAULIC COMPUTATIONS	D-1
APPENDIX E - INFORMATION AS CONTAINED IN THE NATIONAL INVENTORY OF DAMS	E-1

d. Reservoir Area

The immediate reservoir area appeared to be relatively shallow containing some marsh vegetation. The visual inspection showed the overall reservoir area to be in general agreement with the U.S.G.S. map. A description of the drainage area is given in Section 1.3.a of this report. The amount of siltation in the reservoir is not known.

e. Downstream Channel

The downstream channel as viewed from the dam is shown in photo 3. Numerous trees line the downstream channel and several dead trees have fallen across the channel.

3.2 Evaluation

Visual inspection of the dam indicates the dam is in poor condition. This dam has been inspected by the Massachusetts Department of Public Works in 1972, and 1977. The March 1977 inspection Report summarized the overall condition as "conditionally safe--major repairs needed." In a letter to the owner dated October 31, 1977, the Massachusetts Division of Waterways expressed concern with the "structural integrity and physical condition" of the dam.

Comparing the condition of the dam as described in the earlier inspection reports with the visual examination made during this inspection, it appears that the degree of erosion of the earthfill is continuing to increase and the present condition of the dam is poor.

A sketch of the dam from a previous inspection report, dated June 15, 1972, indicates a 5 to 6 foot high stone masonry wall at the downstream face of the dam. Severe erosion of the soil on the upstream side of this wall has occurred as shown in photo 5. It appears as if a portion of the upstream face of the stone wall near the spillway chute has been exposed as a result of erosion of the earth behind it, and the stones which formed the wall have toppled, as shown in photos 3 and 5.

c. Appurtenant Structures

At the time of inspection, the spillway chute was partially filled with debris as shown in photo 1. A large pile of debris existed on top of the dam immediately to the left of the spillway chute as shown in photo 8. This debris prevented visual observation of the sluiceway gate and the stop log provision area. No stop logs were in place at that time.

The condition shown by photos 1 and 2, indicate that the concrete chute was probably originally poured directly into the fill embankment. Erosion of fill has since separated the concrete from the fill. The general condition of the surface concrete appeared to be good with some minor spalling.

The upstream concrete apron shown in photos 8 and 9 were partially covered by frozen debris and water. The general condition of the surface concrete which could be observed was good.

SECTION 3
VISUAL INSPECTION

3.1 Findings

a. General

The dam, Leverett Pond, was field inspected on November 27, 1978. At that time, the water upstream of the concrete apron had begun to freeze at the surface for approximately 4" below the top of the apron. Some small quantity of water was trickling through the spillway chute. The spillway chute was full of debris and a large mound of debris was sitting on top of the left side of the dam.

b. Dam

The dam consists of an earthfill structure with an upstream concrete face. The structure was built in what appears to be a bedrock low about 20 feet wide. A concrete spillway chute passes through the earth fill at the approximate center of the dam. A general view of the dam is shown in photo 4. The dam abutments consist of bedrock.

Erosion of the earth fill due to overtopping has occurred next to the spillway chute walls. This erosion is more severe at the downstream end of the right spillway chute wall. Photo 1 shows the eroded areas next to the spillway chute walls. Photo 2 shows the erosion channel formed in the earth fill adjacent to the right spillway wall.

A clump of three maple trees growing next to the left spillway chute wall is shown in photo 4.

Leverett Pond

SECTION 2
ENGINEERING DATA

2.1 Design

There were no records discovered indicating by whom and when the structure was designed. Indepth engineering calculations appear to be non-existent.

2.2 Construction

No construction data regarding the dam was discovered.

2.3 Operation

No operational manual for the dam exists.

2.4 Evaluation

a. Availability

No plans or design calculations were discovered. State Inspection Reports of the years 1972, 1975, and 1977 were made available at the Department of Environmental Quality Engineering, Division of Waterways, Boston office.

b. Adequacy

The lack of indepth engineering data does not allow for a definitive review. Therefore the adequacy of this dam, structurally and hydraulically, can not be assessed from the standpoint of review of design calculations, but must be based primarily on the visual inspection, past performance history and sound engineering judgement.

c. Validity

The field investigation indicates that the external features substantially agree with those shown on the 1972 State Inspection Report sketch.

Leverett Pond

but normal procedure appears to be to leave it in place. In addition the spillway chute has provisions for a 6 inch stop log, which can be used to raise the level of the lake to the top of the embankment. The upstream invert elevation of the spillway chute is 412₊. The elevation of the earth embankment is 417₊.

g. Dam

- (1) Type-----gravity, stone, concrete, earth
- (2) Length-----15'
- (3) Height-----6'+
- (4) Top Width-----15'
- (5) Side Slopes-----vertical U.S. and D.S.
- (6) Zoning-----actual interior unknown
- (7) Impervious Core-----concrete wall on upstream face
- (8) Cutoff-----none
- (9) Grout curtain-----none

h. Diversion and Regulating Tunnel -----none

i. Spillway

- (1) Type (entire dam acts as spillway)-----broad crest
- (2) Length of weir-----15'
- (3) Crest elevation-----417
- (4) Gates---(1'x1.5' sluice box, 6" stop log provision)
- (5) U/S Channel -----none
- (6) D/S Channel-----Spillway chute 2' wide for
10' downstream of stop log

j. Regulating Outlets

The regulating outlet for this dam consists of a 2 foot wide by 5 foot deep, 10± foot long concrete spillway chute. As previously described, a 2' by 2' wooden slide gate, covering a 1.5 x 1 foot opening, is set in 3" angle iron guides at the upstream base of the spillway. Apparently the gate could be operated manually,

Leverett Pond

c. Elevation (ft. above MSL)

(1)	Streambed at centerline of dam-----	410±
(2)	Maximum tailwater-----	413±
(3)	Upstream portal invert diversion tunnel-----	none
(4)	Recreation pool-----	(spillway crest) 417±
(5)	Full flood control pool-----	N/A
(6)	Spillway crest (with stop log)	417±
(7)	Design surcharge (Original Design)-----	unknown
(8)	Top Dam-----	417±
(9)	Test flood design surcharge-----	417.4±

d. Reservoir

(1)	Length of maximum pool-----	4100'
(2)	Length of recreation pool-----	3700'±
(3)	Length of flood control pool-----	N/A

e. Storage (acre-feet)

(1)	Recreation pool-----	525
(2)	Spillway crest pool-----	525
(3)	Top of dam-----	525
(4)	Flood control pool-----	N/A
(5)	Test flood pool-----	570

f. Reservoir Surface (acres)

(1)	Recreation pool-----	100±
(2)	Spillway crest-----	100±
(3)	Top Dam-----	100±
(4)	Flood-control pool-----	N/A
(5)	Test flood pool-----	103±

About 2000 feet downstream of the dam at Montague Street, two buildings are within 200 feet of the outlet stream. There are no additional structures along the outlet stream below this point until its confluence with Doolittle Brook, approximately one mile downstream of the dam.

b. Discharge at Dam Site

There are no outlet works other than the overflow spillway (entire dam) and spillway chute. The chute structure is 2 feet wide by 5 feet deep with an upstream invert elevation of 412± feet. An approximate 2 foot by 2 foot wooden slide gate is located over a 1½ foot by 1 foot concrete sluice box inlet at the upstream base of the spillway. It appears to be the normal procedure to leave this gate in place.

Although this dam was probably originally constructed during the early 1900's, no data is available on maximum known flood discharges at this site. The State Inspection Report for March 24, 1977 noted that the entire dam was being overtopped by 2 to 3 inches of water.

The overflow spillway is ungated. For the 100 year flood inflow (test design flood) equal to 517 cfs, flow over the spillway would be at elevation 417.4 or 0.4 feet over the top of the dam. The entire top of the dam acts as a spillway during high water.

g. Purpose of Dam

The purpose of this dam is to control the water level of Leverett Pond for recreation.

h. Design and Construction History

No plans or records regarding the design or construction of the structure were located. Observation of what appears to be earlier construction, the overall condition of the dam, and reference within the Corps of Engineers Inventory Data Sheet, indicate that the original dam was probably constructed during the early 1900's.

i. Normal Operational Procedure

There is no formal operational procedure for this dam. Normal maintenance is performed by the caretaker. No regulating of the water level is performed by the owner, although the owner attempts to remove any obstructions that may affect the water level of the pond.

1.3 Pertinent Data

a. Drainage Area

The drainage area (442 acres - 0.69 s.m.) is comprised of wooded hilly terrain (60%) and flat or hummocky land around the pond (40%). Runoff drains directly into Leverett Pond.

Development within the drainage area is limited to a few homes at Leverett and along the east and west shores of the pond.

entire dam acts as an overflow spillway. Located upstream and adjacent to the spillway chute, is an approximate 3 foot by 8 foot stepped concrete apron. The spillway has provisions for a 6-inch high stop log. According to the 1975 State Inspection sketch there is a 2' by 2' wooden slide gate covering a 1' by 1½' sluice box inlet located at the upstream base of the spillway chute. The gate is held in place by a set of 3" angle iron guides. During our inspection the sluice gate was covered by trash and ice, making field verification and inspection of this appurtenance impossible.

c. Size Classification

The dam is classified as small according to its height and storage capacity of 6-8 feet and 525 a-f, respectively.

d. Hazard Classification

For a dam failure no structures below the dam appear to be flooded, and loss of life is not apparent. The hazard classification is low.

e. Ownership

The dam is owned by Mrs. Lucille W. Lewis of Main Street, Wendel, Massachusetts 01379. The name of this structure is also referred to as Beamon-Marvel Co., Dam No.2, indicating that a firm by that name may have been a previous owner.

f. Operator

The caretaker of the dam is Mr. Greg L. Woodard of Amherst Road, Sunderland, Massachusetts 01054, Telephone (413) 665-3948.

b. Purpose

(1) Perform technical inspection and evaluation of non-Federal dams to identify conditions which threaten the public safety and thus permit correction in a timely manner by non-Federal interests.

(2) Encourage and assist the States to initiate quickly effective dam safety programs for non-Federal dams.

(3) To update, verify and complete the National Inventory of Dams.

1.2 Description of Project

a. Location

The dam, Leverett Pond, is located in the Town of Leverett in Franklin County, Massachusetts. The pond is formed by the overland and ground flow of the surrounding hilly area. The dam is located at the northern shore of the pond. Leverett Pond is shown on the U.S.G.S. Mt. Toby Quadrangle, Massachusetts, with the approximate coordinates of North $42^{\circ} 27' 42''$, West $72^{\circ} 30' 18''$.

b. Description of Dam and Appurtenances

The dam is a relatively low (6-8 feet high) miscellaneous earth fill embankment constructed over a bedrock low about 20 feet wide. The dam abutments consist of bedrock. Located at the center of the embankment is a narrow concrete spillway chute having concrete side walls, a concrete apron, a sluice gate and provisions for stop logs. The spillway chute has a height of about 5 feet, a width of 2 feet and a length of 10 feet. During periods of high pond outflow, the

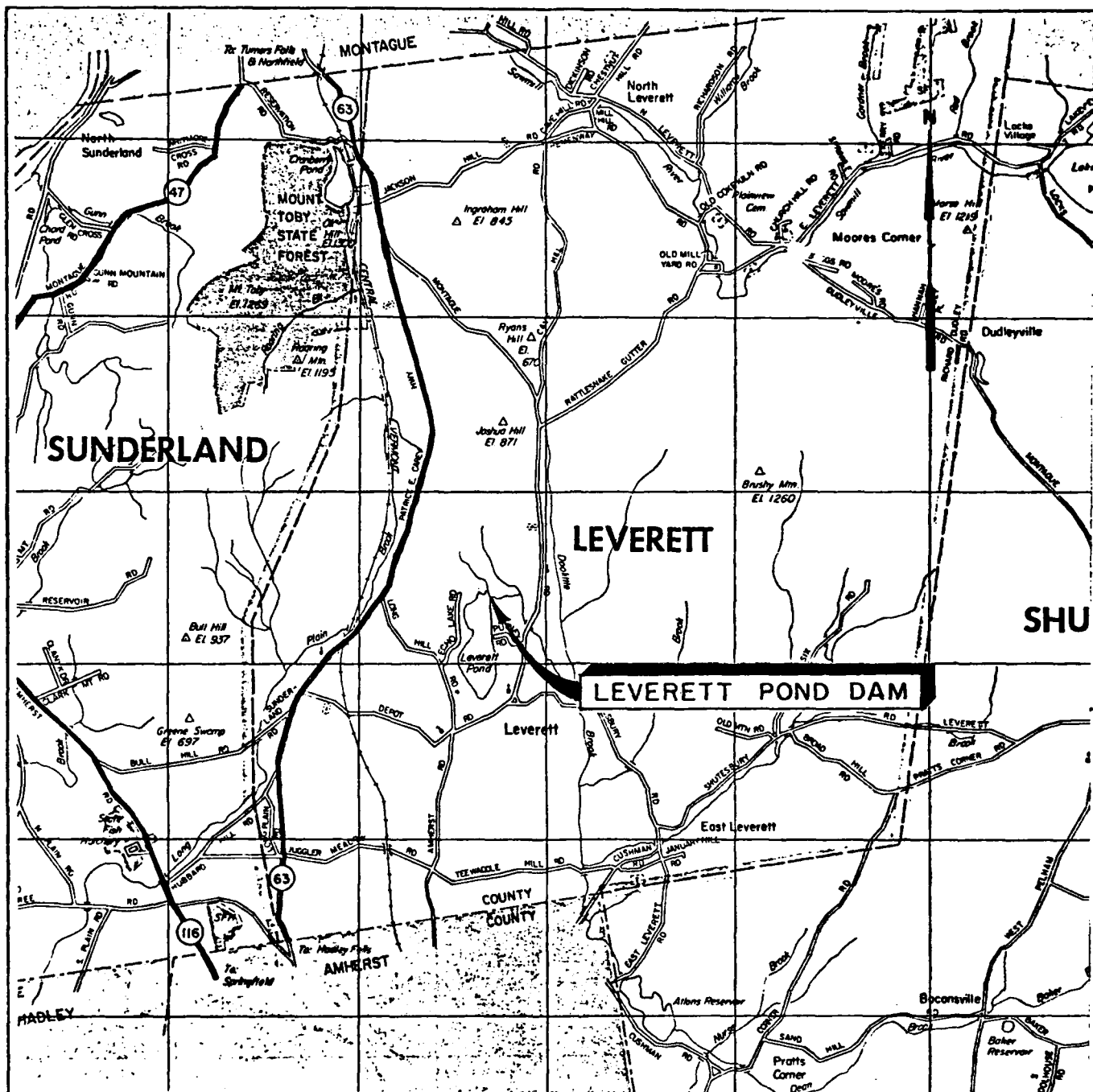
PHASE I
NATIONAL DAM INSPECTION PROGRAM
NAME OF DAM: LEVERETT POND

SECTION 1
PROJECT INFORMATION

1.1 General

a. Authority

Public Law 92-367, August 8, 1972, authorized the Secretary of the Army, through the Corps of Engineers, to initiate a national program of dam inspection throughout the United States. The New England Division of the Corps of Engineers has been assigned the responsibility of supervising the inspection of dams within the New England Region. Hayden, Harding & Buchanan, Inc. has been retained by the New England Division to inspect and report on selected dams in the State of Massachusetts. Authorization and notice to proceed was issued Hayden, Harding & Buchanan, Inc. under a letter of 28 November 1978 from Max B. Scheider, Colonel, Corps of Engineers. Contract No. DACW 33-79-C-0012 has been assigned by the Corps of Engineers for this work.



HAYDEN, HARDING & BUCHANAN, INC.
CONSULTING ENGINEERS
BOSTON, MASSACHUSETTS

U.S. ARMY ENGINEER DIV. NEW ENGLAND
CORPS OF ENGINEERS
WALTHAM, MASS.

NATIONAL PROGRAM OF INSPECTION OF NON-FED. DAMS

LEVERETT POND DAM

LEVERETT

MASSACHUSETTS

SCALE: 1" = 5280'

DATE: FEBRUARY, 1979.



SECTION 4
OPERATIONAL PROCEDURES

4.1 Procedures

No formal operational procedure is performed on this structure. There is some question as to who dictates the level of the pond.

4.2 Maintenance of Dam

The dam is maintained by the caretaker provided by the private owner. Our visual inspection of the dam indicated that little or no maintenance has been performed on the structure over the last several years.

4.3 Maintenance of Operating Facility

There is no formal operational procedure for the dam. According to the 1975 State Inspection Report, some unknown person places boards or stop logs across the notch of the dam. This results in a raising of the pond level by about 6 inches and stops the flow of the brook. The caretaker has removed such obstructions several times in recent years.

4.4 Description of Warning Systems

There are no warning systems associated with this dam.

4.5 Evaluation

There is no formal maintenance program for the structure or the operating facilities. Our visual inspection revealed that trash blocks the spillway. Removal of debris and periodic maintenance should be performed by the caretaker on a regular basis. Although the dam is low hazard regarding failure it should be inspected annually by qualified personnel who

can identify areas of concern which if left unchecked could jeopardize the safety of the dam.

SECTION 5
HYDRAULIC/HYDROLOGIC

5.1 Evaluation of Features

a. General

The dam at Leverett Pond is placed in a narrow outlet valley for a swamp-pond area. The dam is a 6-8 foot high concrete, stone masonry and earthen structure founded on rock. It impounds water for recreational use. The top of the dam (about 15 feet wide) acts as a spillway whenever enough water is impounded and is able to overflow. There is an outlet opening (1.5 x 1 foot) at the base of the dam, with stop log control at the crest. The outlet openings functionality is not known. The pond collects runoff from a 442 acre drainage area and could store about 525 a-f of water. The exact depth of the pond is not known.

b. Design Data

No design data for the dam is available. It appears that a convenient site for impounding water was located and the dam was built.

c. Experience Data

It appears that the dam was used for recreational purposes with summer homes that have been converted for year-round use. No operational or hydrologic records were kept.

e. Overtopping Potential

Due to the dam's small size and low hazard potential, a 100 year storm was used as the test flood. Data was obtained

from USDA-SC-TR 55 for a 100 year, 24 hour type II storm. This storm produced 6.5 inches of rainfall and 3.21 inches of runoff. The inflow is 517 cfs. The maximum outflow at the dam (with allowance for storage) is 15 cfs. This flow would overflow the top of the dam by about 0.4 feet. The entire dam acts as an overflow spillway with the 1½' x 1' outlet closed. If this outlet were functioning and the pond level lowered, considering the ponds storage capacity, the spillway chute could handle the 100 year storm runoff.

f. Dam Failure Analysis

Due to the size (6-8 feet high, 15 feet long, 15 feet wide) and materials used (concrete, stone, earth) failure of this dam from overtopping does not seem likely. If some event occurred and caused a complete failure with water at the top of dam, the outflow would be 282 cfs. Adding this to the base flow from adjacent drainage area indicates a flow of about 800 cfs.

Water would travel towards Montague Road. The land between the dam and Montague Road is an undeveloped, wooded, swampy area. Two houses occur at Montague Road. It appears that minor flooding, 1 to 2 feet deep, would occur near both houses. The stream stage just before Montague Road is elevation 398.75, about 5 feet deep. Beyond Montague Road is a large undeveloped opened flood plain area which will dissipate the outflow.

If the dam were to fail, without runoff from additional areas being considered, no damage due to flooding appears likely from the 282 cfs outflow. In both cases, loss of life does not seem likely to occur.

SECTION 6
STRUCTURAL STABILITY

6.1 Evaluation of Structural Stability

a. Visual Observations

The visual observations did not disclose any immediate stability problems. Continuing erosion of soil next to the spillway chute walls and next to the stone wall at the downstream end of the dam may lead to instability of the dam.

b. Design and Construction Data

No design or construction data are available. Therefore, the evaluation of the structural stability must be based primarily on the information from the visual inspection.

c. Operating Records

Operating records were not made available.

d. Post-Construction Changes

An inspection report dated June 15, 1972, by the Massachusetts Department of Public Works indicates that the concrete upstream face was added after the initial dam construction.

e. Seismic Stability

The dam is located in Seismic Zone 2 according to USCE guidelines and does not require special analysis for seismic stability.

SECTION 7

ASSESSMENT, RECOMMENDATIONS AND REMEDIAL MEASURES

7.1 Dam Assessment

a. Condition

The visual inspection indicates that the dam is in poor condition.

b. Adequacy of Information

The information available is such that the assessment of the safety of the dam must be based primarily on the visual inspection, past history and engineering judgement.

c. Urgency

The recommendations presented in Sections 7.2 and 7.3 should be implemented within one year after receipt of this Phase I Inspection Report by the owner.

d. Necessity of Additional Investigations

The findings of the visual inspection do not warrant additional investigations. However, the owner should engage a qualified engineer to design adequate repairs to the dam.

7.2 Recommendations

This dam in effect acts as a full width spillway. As this dam is now operated, water can be expected to flow over the crest frequently. Therefore the owner should engage a qualified engineer to design adequate repairs for the downstream eroded areas at the spillway chute and the dam embankment. These repairs should be such that future erosion will be prevented. These areas are shown in photos 1 and 2.

7.3 Remedial Measures

a. Operating and Maintenance Procedures

- (1) Trees adjacent to the left wall of the spillway chute should be removed.
- (2) Debris in the spillway chute and top of the dam should be removed as part of routine maintenance.
- (3) This dam should be inspected annually by qualified personnel who can identify areas of concern which, if left unchecked could jeopardize the safety of the dam.

7.4 Alternatives

Not applicable to this dam.

APPENDIX A
INSPECTION CHECKLIST

VISUAL INSPECTION CHECK LIST
PARTY ORGANIZATION

PROJECT Leverett Pond DATE Nov. 27
TIME 1:00 PM
WEATHER cloudy 25°
W.S. ELEV. 416.5+ U.S. _____ DN.S. _____

PARTY:

1.	Ron. H. Cheney	H H & B	6.
2.	David Vine	H H & B	7.
3.	Daniel P. LaGatta	GEI	8.
4.	Tom Keller	GEI	9.
5.			10.

PROJECT FEATURE	INSPECTED BY	REMARKS
1. Earth and Stone Fill Embankments	Daniel P. LaGatta	
2. Concrete Spillway	Ron H. Cheney	
3.		
4.		
5.		
6.		
7.		
8.		
9.		
10.		

PERIODIC INSPECTION CHECKLIST

PROJECT Leverett Pond DATE Nov. 27, 1978
 PROJECT FEATURE Earthfill/ Concrete Dam NAME Ron H. Cheney
 DISCIPLINE Structural Engineer NAME Daniel P. LaGatta
Geotechnical Engineer

AREA EVALUATED	CONDITION
<u>EMBANKMENT</u>	
crest Elevation	417'+
current Pool Elevation	416.5'+
maximum Impoundment to Date	unknown
surface Cracks	None observed.
pavement Condition	No pavement.
movement or Settlement of Crest	None observed.
lateral Movement	None observed.
vertical Alignment	No vertical misalignment observed.
horizontal Alignment	No horizontal misalignment observed.
Condition at Abutment and at Concrete Structures	Good.
Indications of Movement of Structural Items on Slopes	None observed.
Infringing on Slopes	Not significant
Sloughing or Erosion of Slopes or Abutments	Erosion next to walls of spillway chute; erosion upstream of stone pile.
Rock Slope Protection - Riprap Failures	Not applicable.
Unusual Movement or Cracking at or Near Toes	Erosion of toe; dry stone masonry wall (formally downstream face) toppled.
Unusual Embankment or Downstream Seepage	None observed.
Piping or Boils	None observed.
Foundation Drainage Features	None observed.
Toe Drains	None.
Instrumentation System	None.
Vegetation	Trees and brush near dam but are not menacing except for those immediately adjacent to concrete structure.

PERIODIC INSPECTION CHECK LIST

PROJECT Leverett Pond DATE Nov. 27, 1978
 PROJECT FEATURE Inlet Structure and Apron NAME Ron H. Cheney
 DISCIPLINE Structural Engineer NAME Daniel P. LaGatta
Geotechnical Engineer

AREA EVALUATED	CONDITIONS
<p><u>OUTLET WORKS - INTAKE CHANNEL AND INTAKE STRUCTURE</u></p> <p>a. Approach Channel</p> <p>Slope Conditions</p> <p>Bottom Conditions</p> <p>Rock Slides or Falls</p> <p>Log Boom</p> <p>Debris</p> <p>Condition of Concrete Lining</p> <p>Drains or Weep Holes</p> <p>b. Intake Structure</p> <p>Condition of Concrete</p> <p>Stop Logs and Slots</p>	<p>There is no approach channel. There is a stepped concrete apron upstream of the stop log area. Frozen water to within 6 inches of the top of the apron impeded inspection of this facility. The condition of the surface concrete appeared to be good with only minor spalling.</p> <p>The intake-outlet structures are the sluiceway gate and the stop logs. The sluiceway gate could not be observed during this inspection due to frozen debris blocking the chute. There were no stop logs in place during the inspection. Frozen debris in the stop log provision area impeded inspection of this facility</p>

PERIODIC INSPECTION CHECK LIST

T Leverett Pond DATE Nov. 27, 1978
 T FEATURE Spillway Chute NAME Ron H. Cheney
 LINE Structural Engineer NAME Daniel P. LaGatta
Geotechnical Engineer

AREA EVALUATED	CONDITIONS
WORKS - TRANSITION AND CONDUIT	
General Condition of Concrete	There is a concrete chute downstream of the inlet structure. The general condition of the surface concrete was good with some spalling. Frozen debris lined the chute floor. Erosion of fill adjacent to the spillway created a void of several inches between the concrete and the fill.
Staining on Concrete	
Spalling	
Erosion or Cavitation	
Cracking	
Alignment of Monoliths	
Alignment of Joints	
Numbering of Monoliths	

PERIODIC INSPECTION CHECK LIST

JECT Leverett Pond DATE Nov. 27, 1978
 JECT FEATURE Outlet Channel and Structure NAME Ron H. Cheney
 CIPLINE Structural Engineer NAME Daniel P. LaGatta
Geotechnical Engineer

AREA EVALUATED	CONDITIONS
<u>ET WORKS - OUTLET STRUCTURE AND</u> <u>UTLET CHANNEL</u> General Condition of Concrete Rust or Staining Spalling Erosion or Cavitation Visible Reinforcing Any Seepage or Efflorescence Condition at Joints Drain Holes Channel Loose Rock or Trees Overhanging Channel Condition of Discharge Channel	The inlet-outlet structure is the sluice gate and stop logs previously discussed. None observed. Filled with debris. None of significance. Not entirely visible due to debris.

PERIODIC INSPECTION CHECK LIST

Leverett Pond

DATE Nov. 27, 1978

FEATURE Spillway

NAME Ron H. Cheney

INE Structural Engineer

NAME Daniel P. LaGatta

Geotechnical Engineer

AREA EVALUATED	CONDITIONS
<p><u>WORKS - SPILLWAY WEIR, APPROACH</u></p> <p><u>DISCHARGE CHANNELS</u></p> <p>Approach Channel</p> <p>General Condition</p> <p>Close Rock Overhanging Channel</p> <p>Sees Overhanging Channel</p> <p>Door of Approach Channel</p> <p>and Training Walls</p> <p>General Condition of Concrete</p> <p>Cracks or Staining</p> <p>Spalling</p> <p>Any Visible Reinforcing</p> <p>Any Seepage or Efflorescence</p> <p>Crack Holes</p> <p>Discharge Channel</p> <p>General Condition</p> <p>Close Rock Overhanging Channel</p> <p>Sees Overhanging Channel</p> <p>Door of Channel</p> <p>Other Obstructions</p>	<p>The spillway is comprised of the inlet-outlet structure, the sluice gate, the stop log facility and the chute, all were previously described. At high water level entire top of dam acts as a spillway.</p> <p>The discharge channel is the outlet channel.</p>

LETS: OUTLET CONTROLS AND DRAWDOWN

Center of dam-2'W.X1 1/2'H. concrete spillway with 4 1/2'high

No. 1 Location and Type: drawwell and concrete chute.

Provisions for a 6" high stoplog-none in place at
Controls yes, TYPE: time of inspection.

Automatic . Manual x. Operative Yes , No x.

Comments: No stoplog evident on day of inspection-water over topping
easterly abutment.

No. 2 Location and Type: Base of spillway-1'H.X1 1/2'W. concrete box sluice.

Controls yes, Type: Wood slidegate set in 3" angle iron guides.

Automatic . Manual x. Operative Yes x, No .

Comments: Gate appears to be sound and in working order.

No. 3 Location and Type:

Controls , Type:

Automatic . Manual . Operative Yes , No .

Comments:

Drawdown present Yes x, No . Operative Yes x, No .

Comments: See item #2 above.

UPSTREAM FACE: Slope Vertical, Depth Water at Dam 5'

Material: Turf . Brush & Trees . Rock fill . Masonry . Wood

Other Concrete and stone masonry wall.

Condition: 1. Good . 3. Major Repairs .

2. Minor Repairs x. 4. Urgent Repairs .

Comments: Top of dam on So. Easterly side shows minor erosion from over topping
Area over topped by 1/2' of water flow on day of inspection-subgrade
appears to be a rock shale which would erode very slowly.

DOWNSTREAM FACE: Slope Vertical at drawwall.

Material: Turf x. Brush & Trees . Rock Fill x. Masonry . Wood

Other Concrete and stone masonry wall

Condition: 1. Good . 3. Major Repairs .

2. Minor Repairs x. 4. Urgent Repairs .

Comments: Ends of spillway chute side walls show minor unraveling. Earth fill
buttressing so. easterly chute sidewall slowly eroding from over top
of inspection-minor unraveling of concrete apron on

INSPECTION REPORT - DAMS AND RESERVOIRS

LOCATION:

City/Town Leverett County Franklin Dam No. 2-6-154-1Name of Dam Leverett Pond Dam

Mass. Rect.

Topo Sheet No. 11 B Coordinates: N 534,000, E 328,700

Date

Inspected by: Harold T. Shumway, On March 24, 1977 Last Inspection 3-6-75Inspected on: As of March 24, 1977Inspected by: Assessors X, Reg. of Deeds , Prev. Insp. X, Per. Contact X

<u>Mrs. Lucille M. Lewis, Main Street, Wendell, Mass.</u>	<u>617-544-6317</u>
Name	Tel. No.

<u> </u>	<u> </u>	<u> </u>	<u> </u>	<u> </u>
Name	St. & No.	City/Town	State	Tel. No.

<u> </u>	<u> </u>	<u> </u>	<u> </u>	<u> </u>
Name	St. & No.	City/Town	State	Tel. No.

RETAINER: (if any) e.g. superintendent, plant manager, appointed by
absentee owner, appointed by multi owners.

<u>Mr. Gregg L. Woodward, Montague Road, Leverett, Mass.</u>	<u> </u>
Name	Tel. No.

DATA:

No. of Pictures Taken None Sketches See description of Dam.
Plans, Where None located.

DEGREE OF HAZARD: (if dam should fail completely)*

- | | |
|---------------------------|-----------------------------|
| 1. Minor <u> </u> | 3. Severe <u>X</u> |
| 2. Moderate <u> </u> | 4. Disastrous <u> </u> |

Comments: approx. 133 million gallons impoundment—could cause severe damage in
area of Tewadde Hill Road and Cushman Road.

*This rating may change as land use changes (future development).



EXECUTIVE OFFICE OF ENVIRONMENTAL AFFAIRS
DEPARTMENT OF ENVIRONMENTAL QUALITY ENGR.
DIVISION OF WATERWAYS

100 Nashua Street, Boston 02114

May 13, 1977

Lucille W. Lewis
Street
all, Massachusetts

Re: Insp. Dam #2-6-154-1
Leverett Pond Dam
Leverett

Mrs. Lewis:

3-24-77, an Engineer from the Massachusetts Department of Public Works made a visual inspection of the above dam. Our records indicate the owner to be Lucille W. Lewis. If this information is incorrect, will you please notify this office.

Inspection was made in accordance with the provisions of Chapter 26A of the Massachusetts General Laws as amended (Dams Safety Act). Chapter 706 of the Acts of 1975 transferred the jurisdiction of the so-called "Dams Safety Program" to the Commissioner of the Department of Environmental Quality Engineering.

Results of the inspection indicate that this dam is conditionally safe. The following conditions were noted that require attention:

Washouts still evident. Easterly one still eroding from present top. Top and downstream slope on easterly side of dam being eroded. Minor unraveling of concrete apron on southeasterly end of dam. Minor cracks in top of walls.

Call these conditions to your attention before they become serious. It will be more expensive to correct. With any correspondence please include the number of the dam as indicated above.

Sincerely yours,


W. Hannon, P.E.
Chief Engineer

F.Y. Hoey
H.T. Shumway
Mr. Gregg Woodward (Caretaker)
Montague Rd.
Leverett, Massachusetts

October 31, 1977

Mrs. Lucille W. Lewis
Main Street
Wendell, Massachusetts

RE: Inspection Dam #2-6-154-1
Leverett Pond Dam
Leverett

Dear Mrs. Lewis:

Reference is made to a recent telephone inquiry from Representative Thomas Simons concerning maintenance work at the above referenced dam.

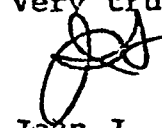
Please be advised that we are concerned with the structural integrity and physical condition of that dam. As owner of that facility, you are responsible for it and any associated liability should the dam fail and cause personal property damage to abutters downstream.

Representative Simons mentioned that a cooperative maintenance activity had or has been agreed upon by you and the Leverett Pond Association relative to correcting the deficiencies reported in our memorandum dated May 13, 1977. If that is the case, the corrective work should be initiated as soon as possible. We are not concerned with who performs the work; that is, the owner or the Association, but are concerned that the work progress timely and properly.

If we may be of further assistance, please contact me in Boston at 727-4796.

Thank you for your assistance in resolving this matter.

Very truly yours,



John J. Hannon, P.E.
Chief Engineer

JJH:hlb
cc:Rep. Thomas Simons
F.J.Hoey, Dist. Hwy Engr.
H.T.Shumway, Dams Engr.
Mr. Gregg Woodward (Caretaker)

INSPECTION REPORT - DAMS AND RESERVOIRS

LOCATION:

City/Town Leverett County Franklin Dam No. 2-6-154-1

Name of Dam Leverett Pond Dam

Mass. Rect.

Topo Sheet No. 11 B Coordinates: N 534,000, E 328,700

Date

Inspected by: Harold T. Shumway, On March 24, 1977 Last Inspection 3-6-75

OWNER/S: As of March 24, 1977

per: Assessors X, Reg. of Deeds , Prev. Insp. X, Per. Contact X

1. Mrs. Lucille W. Lewis, Main Street, Wendell, Mass. 617-544-6317
Name St. & No. City/Town State Tel. No

2.
Name St. & No. City/Town State Tel. No

3.
Name St. & No. City/Town State Tel. No

5. CARETAKER: (if any) e.g. superintendent, plant manager, appointed by
absentee owner, appointed by multi owners.

Mr. Gregg L. Woodward, Montague Road, Leverett, Mass.
Name St. & No. City/Town State Tel. No

4. DATA:

No. of Pictures Taken None Sketches See description of Dam.
Plans, Where None located.

5. DEGREE OF HAZARD: (if dam should fail completely)*

1. Minor 3. Severe X
2. Moderate 4. Disastrous

Comments: Approx. 133 million gallons impoundment - could cause severe damage in
area of Teawdale Hill Road and Cushman Road.

*This rating may change as land use changes (future development).

(12)

OVERALL CONDITION:

1. Safe _____
2. Minor repairs needed _____
3. Conditionally safe - major repairs needed X _____
4. Unsafe _____
5. Reservoir impoundment no longer exists (explain)
Recommend removal from inspection list _____

REMARKS AND RECOMMENDATIONS: (Fully Explain)

See items Nos. 7, 8, and 11 for areas noted that appear in need of attention and repairs. The entire dam from spillway chute south easterly to abutting ledge outcrop was being over topped on day of inspection to a depth of 2 to 3 inches. The spillway chute was clear of any debris and over flowing from water runoff. The area being over topped shows minor erosion from the concrete face wall downstream to end of spillway chute. At the end of the chute sidewalls a small wash out of back fill has occurred. It appears that at one time a concrete apron or cap covered part of the area now being over topped and eroded but over the years a large portion of this cap has unravelled.

The main spillway structure and concrete upstream facewall appeared to be basically sound and safe at time of inspection.

Mrs. Lucille W. Lewis, owner of this dam, was contacted by telephone on March 25, 1977, at 4:00 P.M. and informed of the conditions found at the dam site this inspection. She was also informed of her responsibilities as owner of this dam. She stated that she would have her caretaker check into the situation immediately.

9 EMERGENCY SPILLWAY: Available Yes . Needed _____.

Height Above Normal Water: 1/2 Ft.

Width 20 Ft. Height 20'± Ft. Material Ledge and concrete

Condition: 1. Good _____.

3. Major Repairs _____.

2. Minor Repairs X _____.

4. Urgent Repairs _____.

Comments: Entire top of dam structure and abutting ledge face would serve as overflow spillway in emergency. See item #8 for condition of this area.

10 WATER LEVEL AT TIME OF INSPECTION: 3/4 Ft. Above X . Below _____.

Top Dam _____ F.L. Principal Spillway X _____.

Other _____

Normal Freeboard 1/2 Ft.

11 SUMMARY OF DEFICIENCIES NOTED:

Growth (Trees and Brush) on Embankment None found.

Animal Burrows and Washouts Old washouts still evident-easterly one still eroding from present over topping.

Damage to Slopes or Top of Dam Top and downstream slope on easterly side of dam being eroded.

Cracked or Damaged Masonry Minor unraveling of concrete apron on south easterly end of dam-minor cracks in top of concrete walls.

Evidence of Seepage None found.

Evidence of Piping None found.

Leaks None found.

Erosion See damage to slopes or top of dam above.

Trash and/or Debris Impeding Flow None found.

Clogged or Blocked Spillway None found.

Other _____

6. OUTLETS: OUTLET CONTROLS AND DRAWDOWN

Center of dam-2'W.X $\frac{1}{2}$ 'H. concrete spillway with 4 $\frac{1}{2}$ ' high
No. 1 Location and Type: dropwall and concrete chute.

Provisions for a 6" high stoplog-none in place at
Controls Yes, TYPE: time of inspection.

Automatic . Manual X. Operative Yes , No X.

Comments: No stoplog evident on day of inspection-water over topping
easterly abutment.

No. 2 Location and Type: Base of spillway-1'H.X1 $\frac{1}{2}$ 'W. concrete box sluice.

Controls Yes, Type: Wood slidegate set in 3" angle iron guides.

Automatic . Manual X. Operative Yes X, No .

Comments: Gate appears to be sound and in working order.

No. 3 Location and Type:

Controls , Type:

Automatic . Manual . Operative Yes , No .

Comments:

Drawdown present Yes X, No . Operative Yes X, No .

Comments: See item #2 above.

7. DAM UPSTREAM FACE: Slope Vertical, Depth Water at Dam 5'

Material: Turf . Brush & Trees . Rock fill . Masonry . Wood

Other Concrete and stone masonry wall.

Condition: 1. Good . 3. Major Repairs .

2. Minor Repairs X. 4. Urgent Repairs .

Comments: Top of dam on So. Easterly side shows minor erosion from over topping
Area over topped by $\frac{1}{4}$ ' of water flow on day of inspection-subgrade
appears to be a rock shale which would erode very slowly.

8. DAM DOWNSTREAM FACE: Slope Verticle at dropwall.

Material: Turf X. Brush & Trees . Rock Fill X. Masonry . Wood

Other Concrete and stone masonry wall

Condition: 1. Good . 3. Major Repairs .

2. Minor Repairs X. 4. Urgent Repairs .

Comments: Ends of spillway chute side walls show minor unraveling. Earth fill
buttressing so. easterly chute sidewall slowly eroding from over top
of dam on day of inspection-minor unraveling of concrete apron on sou

INSPECTION REPORT - DAMS AND RESERVOIRS

1. LOCATION:

City/Town Leverett County Franklin Dam No. 2-5-154-1

Name of Dam Leverett Pond Dam

Mass. Rect.

Topo Sheet No. 11 B Coordinates: N 534,000, E 328,700

Date

Inspected by: Harold T. Shumway, On March 24, 1977. Last Inspection 3-6-75

2. OWNER/S: As of March 24, 1977

per: Assessors X, Reg. of Deeds , Prev. Insp. X, Per. Contact X

1. Mrs. Lucille M. Lewis, Main Street, Wendell, Mass. 617-544-6317
Name St. & No. City/Town State Tel. No.

2.
Name St. & No. City/Town State Tel. No.

3.
Name St. & No. City/Town State Tel. No.

3. CARETAKER: (if any) e.g. superintendent, plant manager, appointed by absentee owner, appointed by multi owners.

Mr. Gregg L. Woodard, Montague Road, Leverett, Mass.
Name St. & No. City/Town State Tel. No.

4. DATA:

No. of Pictures Taken None. Sketches See description of Dam.
Plans, Where None located.

5. DEGREE OF HAZARD: (if dam should fail completely)*

1. Minor 3. Severe X

2. Moderate 4. Disastrous

Comments: Approx. 133 million gallons impoundment-could cause severe damage in area of Tewaddle Hill Road and Cushman Road.

*This rating may change as land use changes (future development).



EXECUTIVE OFFICE OF ENVIRONMENTAL AFFAIRS
DEPARTMENT OF ENVIRONMENTAL QUALITY ENGR.
DIVISION OF WATERWAYS

100 Nashua Street, Boston 02114

May 13, 1977

Mrs. Lucille W. Lewis
Main Street
Wendall, Massachusetts

Re: Insp. Dam #2-6-154-1
Leverett Pond Dam
Leverett

Dear Mrs. Lewis:

On 3-24-77, an Engineer from the Massachusetts Department of Public Works made a visual inspection of the above dam. Our records indicate the owner to be Lucille W. Lewis. If this information is incorrect, will you please notify this office.

The inspection was made in accordance with the provisions of Chapter 253 of the Massachusetts General Laws as amended (Dams Safety Act). Chapter 706 of the Acts of 1975 transferred the jurisdiction of the so-called "Dams Safety Program" to the Commissioner of the Department of Environmental Quality Engineering.

The results of the inspection indicate that this dam is conditionally safe. The following conditions were noted that require attention:

Old washouts still evident. Easterly one still eroding from present over-topping. Top and downstream slope on easterly side of dam being eroded. Minor unraveling of concrete apron on southeasterly end of dam. Minor cracks in top of walls.

We call these conditions to your attention before they become serious and more expensive to correct. With any correspondence please include the number of the dam as indicated above.

Very truly yours,

John F. Hannon, P.E.
Chief Engineer

AM:

cc: F.Y. Hoey
H.T. Shumway
Mr. Gregg Woodward (Caretaker)
Montague Rd.
Leverett, Massachusetts

LIST OF AVAILABLE ENGINEERING DATA

No engineering data was available for this dam.

Leverett Pond

APPENDIX B
ENGINEERING DATA

PERIODIC INSPECTION CHECK LIST

PROJECT Leverett Pond DATE Nov. 27, 1978
 PROJECT FEATURE Service Bridge NAME Ron H. Cheney
 DISCIPLINE Structural Engineer NAME Daniel P. LaGatta
Geotechnical Engineer

AREA EVALUATED

CONDITIONS

OUTLET WORKS - SERVICE BRIDGE

a. Super Structure

There is no service bridge for this facility.

Bearings

Anchor Bolts

Bridge Seat

Longitudinal Members

Under Side of Deck

Secondary Bracing

Deck

Drainage System

Railings

Expansion Joints

Paint

b. Abutment and Piers

General Condition of Concrete

Alignment of Abutment

Approach to Bridge

Condition of Seat and Backwall

PERIODIC INSPECTION CHECK LIST

PROJECT Leverett Pond DATE Nov. 27, 1978
 PROJECT FEATURE Spillway NAME Ron H. Chenev
 DISCIPLINE Structural Engineer NAME Daniel P. LaGatta
Geotechnical Engineer

AREA EVALUATED	CONDITIONS
OUTLET WORKS - CONTROL TOWER	
a. Concrete and Structural	There is no control tower for this facility.
General Condition	
Condition of Joints	
Spalling	
Visible Reinforcing	
Rusting or Staining of Concrete	
Any Seepage or Efflorescence	
Joint Alignment	
Unusual Seepage or Leaks in Gate Chamber	
Cracks	
Rusting or Corrosion of Steel	
b. Mechanical and Electrical	Operation of the slide gate and installation of the stop log is performed manually. Both facilities were inoperable during the inspection due to blockage from frozen debris.
Air Vents	
Float Wells	
Crane Hoist	
Elevator	
Hydraulic System	
Service Gates	
Emergency Gates	
Lightning Protection System	
Emergency Power System	
Wiring and Lighting System in Gate Chamber	

9 EMERGENCY SPILLWAY: Available Yes. Needed _____.

Height Above Normal Water: 1/2 Ft.

Width 20 Ft. Height 20[±] Ft. Material Ledge and concrete

Condition: 1. Good _____.

3. Major Repairs _____.

2. Minor Repairs x.

4. Urgent Repairs _____.

Comments: Entire top of dam structure and abutting ledge face would serve as overflow spillway in emergency. See item #8 for condition of this area.

10 WATER LEVEL AT TIME OF INSPECTION: 3/4 Ft. Above x. Below _____.

Top Dam _____ F.L. Principal Spillway x.

Other _____

Normal Freeboard 1/2 Ft.

11 SUMMARY OF DEFICIENCIES NOTED:

Growth (Trees and Brush) on Embankment None found

Animal Burrows and Washouts Old washouts still evident-easterly one still eroding from present over topping.

Damage to Slopes or Top of Dam Top and downstream slope on easterly side of dam being eroded.

Cracked or Damaged Masonry Minor unraveling of concrete apron on south easterly end of dam-minor cracks in top of concrete walls.

Evidence of Seepage None found.

Evidence of Piping None found.

Leaks None found.

Erosion See damage to slopes or top of dam above.

Trash and/or Debris Impeding Flow None found.

Clogged or Blocked Spillway None found.

Other _____

(12)

OVERALL CONDITION:

1. Safe_____.
2. Minor repairs needed_____
3. Conditionally safe - major repairs needed_____ X
4. Unsafe_____.
5. Reservoir impoundment no longer exists (explain)
Recommend removal from inspection list_____

(13)

REMARKS AND RECOMMENDATIONS: (Fully Explain)

See items Nos. 7, 8, and 11 for areas noted that appear in need of attention and repairs. The entire dam from spillway chute south easterly to abutting ledge outcrop was being over topped on day of inspection to a depth of 2 to 3 inches. The spillway chute was clear of any debris and over flowing from water runoff. The area being over topped shows minor erosion from the concrete face wall downstream to end of spillway chute. At the end of the chute sidewalls a small wash out of back fill has occurred. It appears that at one time a concrete apron or cap covered part of the area now being over topped and eroded but over the years a large portion of this cap has unravelled.

The main spillway structure and concrete upstream facewall appeared to be basically sound and safe at time of inspection.

Mrs. Lucille W. Lewis, owner of this dam, was contacted by telephone on March 25, 1977, at 4:00 P.M. and informed of the conditions found at the dam site on this inspection. She was also informed of her responsibilities as owner of this dam. She stated that she would have her caretaker check into the situation immediately.

April 7, 1975

Mr. Bradford H. Lewis
Montagne Road
Leverett, Mass.

RE: Inspection-Dam #2-6-154-1
Leverett
Leverett Pond Dam

Dear Mr. Lewis:

On March 6, 1975, an engineer from the Massachusetts Department of Public Works made a visual inspection of the above dam. Our records indicate that you are the designated caretaker for your mother Mrs. Lucille W. Lewis of Main Street, Wendell, Massachusetts. Will you please notify this office if this information is not current.

The inspection was made in accordance with Chapter 253 of the Massachusetts General Laws, as amended by Chapter 595 of the Acts of 1970 (Dams-Safety Act).

The results of the inspection indicate that this dam is safe; however, the following conditions were noted that require attention:

1. The ends of the chute sidewalls have broken away and should be repaired.
2. Old washouts or erosion at the endwalls should be backfilled with suitable material, properly compacted and graded.
3. There is some light growth of brush on the embankment of the dam which should be removed.

We call these conditions to your attention now, before they become serious and more expensive to correct. With any correspondence, please include the number of the dam as indicated above.

Very truly yours,

NLD

NORMAN L. DIEGOLI, P.E.
Acting Deputy Chief Engineer

RL
LEA:jap
cc: F. J. Hoey
R. Salls

INSPECTION REPORT - DAMS AND RESERVOIRS

1. LOCATION:

City/Town Leverett . County Franklin . Dam No. 2-6-154-1

Name of Dam Leverett Pond Dam
Mass. Rect.

Topo Sheet No. 11 B . Coordinates: N 534,000 , E 328,700 .

Inspected by: Harold T. Shumway , On March 6, 1975 . Date
Last Inspection 6-15-72

2. OWNER/S: As of 6-15-72

per: Assessors _____, Reg. of Deeds _____, Prev. Insp. _____, Per. Contact _____

1. Mrs. Lucille W. Lewis, Main Street, Wendell, Mass. 617-544-6317
Name St. & No. City/Town State Tel. No.

2. _____
Name St. & No. City/Town State Tel. No.

3. _____
Name St. & No. City/Town State Tel. No.

3. CARETAKER: (if any) e.g. superintendent, plant manager, appointed by absentee owner, appointed by multi owners.

Mr. Bradford H. Lewis, Montague Road, Leverett, Mass. 413-549-6498
Name St. & No. City/Town State Tel. No.

4. DATA:

No. of Pictures Taken None . Sketches See description of Dam.
Plans, Where None located .

5. DEGREE OF HAZARD: (if dam should fail completely)*

1. Minor _____ 3. Severe X _____

2. Moderate _____ 4. Disastrous _____

Comments: Large volume (133 million gallons) could cause severe damage in area of Tewaddle Hill Rd. and Cushman Rd.

*This rating may change as land use changes (future development).

6. OUTLETS: OUTLET CONTROLS AND DRAWDOWN

No. 1 Location and Type: Center of dam - 2' W. x 6" H. conc. spillway with 4 1/2' dropwall and conc. chute

Controls Yes, TYPE: There is provision for 6" H. stop log - none in place at time of inspection

Automatic . Manual X. Operative Yes X, No .

Comments: Concrete structure appears sound

No. 2 Location and Type: Base of spillway - 1' H. x 1 1/2' W. conc. box sluice

Controls Yes, Type: Wood slide gate set in 3" x iron guides

Automatic . Manual X. Operative Yes , No .

Comments: Top of gate 2 1/2' below crest of spillway - appears sound

No. 3 Location and Type:

Controls , Type:

Automatic . Manual . Operative Yes , No .

Comments:

Drawdown present Yes X, No . Operative Yes X, No .

Comments: See Item #2 above

7. DAM UPSTREAM FACE: Slope Vertical, Depth Water at Dam 4'

Material: Turf . Brush & Trees . Rock fill . Masonry . Wood

Other Concrete and stone masonry wall

Condition: 1. Good X.

3. Major Repairs .

2. Minor Repairs .

4. Urgent Repairs .

Comments: No cracks or spalling evident in structure

8. DAM DOWNSTREAM FACE: Slope Vertical at dropwall

Material: Turf X. Brush & Trees . Rock Fill X. Masonry . Wood

Other Concrete and stone masonry wall

Condition: 1. Good .

3. Major Repairs .

2. Minor Repairs X.

4. Urgent Repairs .

Comments: Ends of spillway chute sidewalls beginning to unravel. Old washou or erosion of earth at ends of walls appear to have stabilized.

9. EMERGENCY SPILLWAY: Available X. Needed _____.

Height Above Normal Water: 1/2 Ft.

Width 20 Ft. Height 20 + Ft. Material Ledge and concrete.

Condition: 1. Good X. 3. Major Repairs _____.

2. Minor Repairs _____. 4. Urgent Repairs _____.

Comments: Entire top of dam structure and abutting ledge face would serve as emergency spillway

10. WATER LEVEL AT TIME OF INSPECTION: 1/3 Ft. Above X. Below _____.

Top Dam _____ F.L. Principal Spillway X.

Other _____

Normal Freeboard 1/2 Ft.

11. SUMMARY OF DEFICIENCIES NOTED:

Growth (Trees and Brush) on Embankment Light growth of small brush on slopes

Animal Burrows and Washouts Yes - old washout still evident at ends of chute sidewalls.

Damage to Slopes or Top of Dam None found

Cracked or Damaged Masonry Ends of chute sidewalls broken away

Evidence of Seepage None found

Evidence of Piping None found

Leaks None found

Erosion Yes - see washout above - appears to be stabilized at present

Trash and/or Debris Impeding Flow Yes - 2 medium size boulders in stream bed at end of chute spillway

Clogged or Blocked Spillway None found

Other _____

(12.)

OVERALL CONDITION:

1. Safe_____.
2. Minor repairs needed_____ X
3. Conditionally safe - major repairs needed_____
4. Unsafe_____.
5. Reservoir impoundment no longer exists (explain)
Recommend removal from inspection list_____

(13.)

REMARKS AND RECOMMENDATIONS: (Fully Explain)

This appears to be an old but structurally sound stone and concrete dam built across a gap or depression in ledge outcropping about 20' to 30' wide and 5' to 6' deep. At time of inspection approximately 4 inches of water was flowing through the 2' wide and 6" high spillway notch in center of dam. No stop log was evident at crest of spillway notch. Investigation of base of dropwall showed a rectangular sluice opening 1' high and 1½' wide at and thru base of dam. Wood gate at upstream end of sluice appears sound. Ends of chute sidewalls at downstream toe are beginning to break away or unravel slightly. Old washouts in this area are still evident but do not appear to have enlarged any since last inspection of June 15, 1972. Some light brush growth was noted on earth slopes. Conversation with caretaker's wife by phone on March 7, 1975 brought out information that due to secluded, isolated area of dam, some problems have arisen concerning water level of pond.

Apparently persons unknown place boards or stop logs across notch or weir of dam, thereby raising level of pond 6 inches. She stated her husband has had to remove these obstructions several times in recent years. The fact that some obstruction has been put in place on dam is soon noticed, however, as brook stops flowing downstream.

Mr. Bradford H. Lewis, Montague Road, Leverett, Massachusetts, is the caretaker of dam and is the owner's son. He requested any correspondence concerning dam be sent to him as caretaker of same.

The District recommends that due to somewhat isolated area dam is in and due to large impoundment of water held back by dam, that caretaker be directed to repair washouts and ends of chute sidewalls. Also the two boulders in stream bed should be removed to allow free movement of water flow.

Dam appeared safe at time of inspection.

RCS/jc/vk

LEVERETT POND

JUNE 15, 1972

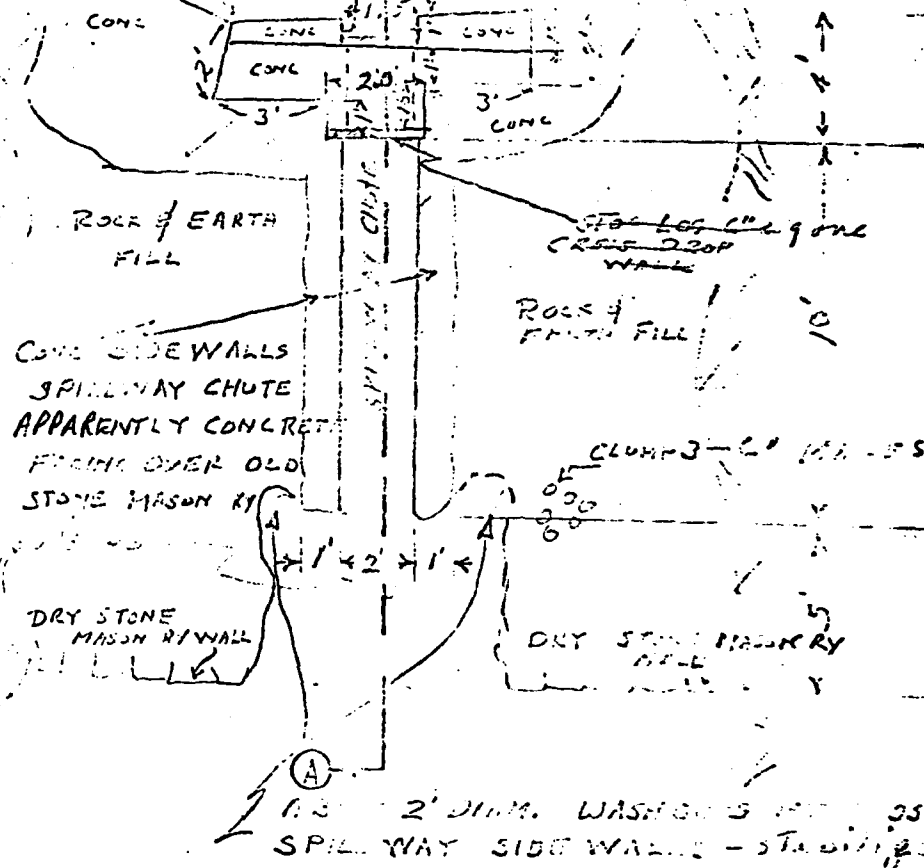
SKETCH

NOT TO SCALE

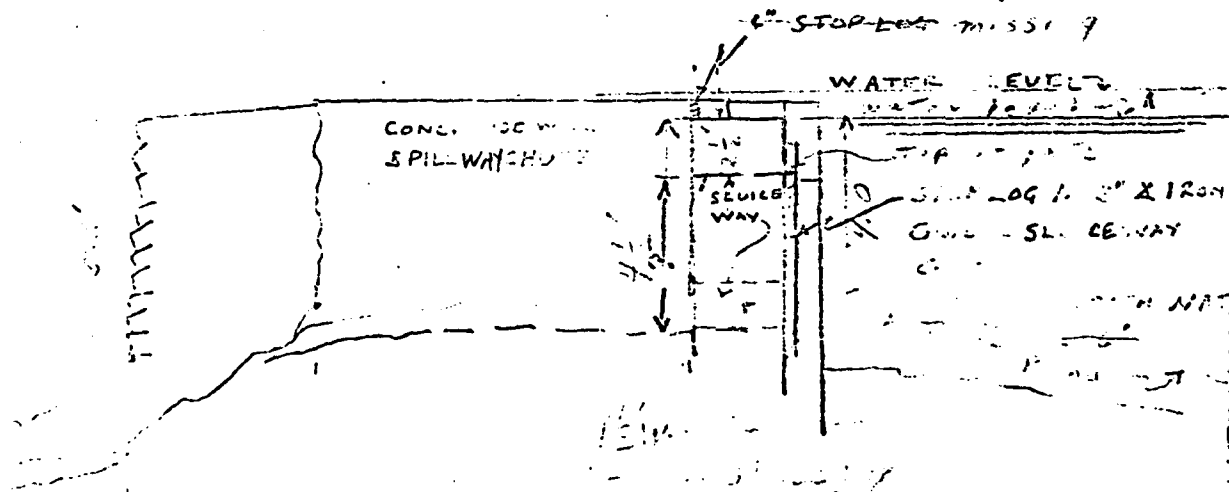
INLET 40F ± WIDE
POND - DEPTH 6' POND

3" X IRON GUILL
SLUICE WAY
UNDER

LEDGE



PLAN - NOT TO SCALE DIMENSIONS ESTIMATED



SECTION A-A - ALL DIMENSIONS ESTIMATED

3-6-75

July 7, 1972

Mrs. Lucille W. Lewis
Main Street
Needell, Massachusetts

RE: Inspection of Dam #2-6-154-1
Leverett
Leverett Pond Dam

Dear Mrs. Lewis:

An engineer from the Massachusetts Department of Public Works has inspected the above dam, of which you are the owner.

The inspection was made in accordance with Chapter 253 of the Massachusetts General Laws, as amended by Chapter 595 of the Acts of 1970.

The result of the inspection indicates that no immediate maintenance or repairs are required; however, the following items were noted that will require your attention in the future:

1. Remove small trees northerly of spillway on downstream slope.
2. Repair the deterioration of concrete (small amount) in spillway sidewall.

We are calling these items to your attention now before they become more serious and expensive to correct.

Very truly yours,

F.C.S.

FRED. C. SCHWELM, P.E.
Deputy Chief Engineer

LRA
LRA:pan
cc: F. J. Joey, DHE #2
R. Salls, Dist. #2

DAM INSPECTION REPORT

Inspected by R. C. Gills P.E. Date June 15, 1972Date Last Inspection 1970

own Leverett County Franklin Dam No. 2-6-154-1
 Name of Dam Leverett Pond Dam USGS ID# 11B Mass. Rect. 534,000
 Coordinate N E 528,700
 Sketch See Description of Dam Picture Available No Plans, Where No
 Owner Representative Notified Date _____ By Letter _____ Tel. _____
 Owner Representative -- Present Yes _____ No X
 Owner Mrs. Lucille W. Lewis Per Town Assessors X As of _____
Main St. Reg. of Deeds _____ June 22, _____
Wendell, Mass. Previous Insp. _____ 1972 _____
 Personal Contact X telephone _____

STRUCTURAL DATADAM TYPE: Gravity Rock fill Straight X Curved _____ Arched _____ Other _____
 DAM MATERIAL: Earth _____ Conc. Mas. X Stone Mas. X Steel _____ Timber _____
 Rock Fill X Old dry stone masonry faced with concrete.

 DAM DIMENSIONS: Length 15+ Ft. Height 8-10 Ft. Widths, Top 17+ Ft.
 Base 17+ Ft.

 Slope Downstream Face Vertical Slope Upstream Face Vertical
 Freeboard Normal None Ft. Depth Water at Dam 6+ Ft.

 DAM FACE UPSTREAM: Turf _____ Brush & Trees _____ Rock Fill _____ Masonry X
 Wood _____ Other Concrete facing on dry stone.

 Condition: 1. Good X 2. Needs Minor Repairs _____
 3. Needs Major Repairs _____
 4. Urgent Needs Repairs for Safety _____

 DAM FACE DOWNSTREAM: Turf _____ Brush & Trees _____ Rock Fill X Masonry _____
 Wood _____ Other _____

 Condition: 1. Good _____ 2. Needs Minor Repairs X
 3. Needs Major Repairs _____
 4. Urgent Needs Repairs for Safety _____

OUTLETS: Locations Center structure

Spillway - Type Drop wall Controlled Stop log

Width 2' Height 6" Material Concrete

Emergency Spillway - Available X Needed

Height above Normal Water zero

Width 15' Height 20' Material Ledge and concrete

Penstock: Size -- Type --

Trickle Tube: Size --

Outlet Controls Available Yes Condition Unknown Automatic

Manual X Needed

Drawdown Device: Present X Needed Condition Unknown

Trash Racks, Screens: Present No Condition

Needed No

AREA DATA

POND: Area 68 Acres Avg. Depth 6 Ft.

Acre Ft. 408

Water Impounded Gals. 133 million

Silted: Yes No X Approx. Amount Pond

DRAINAGE AREA: 0.6 Sq. M. TYPE: City, Bus. & Ind.

Dense Veg. Suburban Rural, Farm 1/8

Wood & Scrub Land 7/8 Slope: Steep 1/2 Med. 1/2 Slight

DOWNSTREAM AREA: Valley Character: Narrow X Wide

Developed Rural X Urban

DEFICIENCIES NOTED:

Growth Trees and Brush on Embankment Yes.

Animal Burrows and Washouts None found.

CIENCIES NOTED (Cont'd.)

-3

Damage to Top or Slope due to Traffic No

Cracked or Damaged Masonry None noted.

Evidence of Piping None found.

Evidence of Seepage None found.

Erosion Yes, at downstream end of spillway side walls.

Leaks None found.

Missing or Inadequate Trash Screens & Rack No rack - does not appear necessary.

Clogged or Blocked Spillways no but some rubbish in spillway channel.

Inadequate Spillways No

Trash and/or Rubbish Available to Impede Flow Wooded Water Shed.

Condition Favorable for Injury to Public, i.e., Unprotected Penstock Opening, etc. Nothing unusual.

Other _____

ERALL CONDITION: 1. Safe _____ 2. Safe, Minor Repairs Needed X

3. Conditional Safe, Need Urgent Repairs _____ 4. Unsafe _____

MARKS and RECOMMENDATIONS

See attached sheet.

S/sd, _____

Att.

Verett Pond Dam
No. 2-8-154-1
Verett

-4

At the time of the inspection, approximately an inch of water was flowing over the crest of the dam for its entire length. A stop log was in place at the weir at the entrance of the spillway chute and the water was flowing over the top of the dam into the spillway chute or through two small washouts at the ends of the spillway chute sidewalls.

The structure is founded on ledge with ledge forming the abutments and is quite wide for its length. It appears to have been originally constructed of dry stone masonry with a stone and earth fill. Later the upstream face, part of the top and the spillway chute were reconstructed or faced with concrete. No cracks were found in this concrete which is at least twenty years old and the entire structure appears sound.

The sluiceway and its gate were under water but the gate when probed with a pole was sound.

There is a clump of small maples near the downstream end of the left or northerly spillway chute wall which should be cut.

The two small washouts at the ends of the spillway chute sidewall should be repaired and the masonry of the chute walls connected to the old dry stone masonry retaining walls to prevent further erosion.

The owner should be advised to perform the above maintenance.

RCS/agn

Number 96

TOWN LEVERETT

2

Name Leverett Pond Dam Inspection Date 1970

Owner

Location 1/2 mile north of Leverett Center

Type of Pond made

Acreage large

Drainage Area

Comments

Type of Dam stone with concrete face

Length 20 feet

Height 6 feet

Head of Water

Comments

Type of Spillway

Width

Height

Comments

Condition, Previous Report, Dated 1968 This dam is safe

Present Condition



HAYDEN, HARDING & BUCHANAN, INC.
CONSULTING ENGINEERS
BOSTON, MASSACHUSETTS

SHEET NO. 1

JOB Dams
SUBJECT Leverett Pond
CLIENT Corio

Area = 4.79 sq in or 0.69 sq mi. 442 a.

Stream Hazard Potential = low

Height $\approx 5'$

area bottom of pond ≈ 410

417 0.86 sq in or 71.7 a

420 1.33 sq in or 122.12 a. 19 sq mi.

410 0.54 49.6 a

Area 410 to 417 = $7 \times \left(\frac{71.7 + 49.6}{2} \right) = 450$ a-f.

Height 5'

Class = small

Hazard Potential = Low

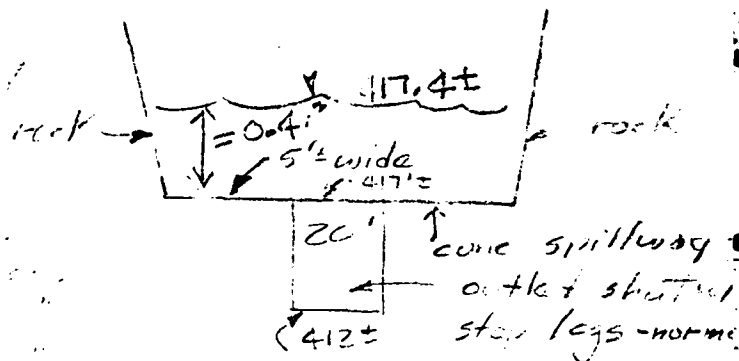
Shed = 100 yr to 112 PMF

U.S. W.B. 100yr 65" rainfall 24 hour USDA-SC-TR 55

U.S. Mod. 5% 24 hr CN = 70 Type II storm Soil B-C

$C = 140$ cfs @ dam outlet

$Q_T = 140 \times 1.15 \times 3.21 \text{ ft}^2 = 517 \text{ cfs}$



$\frac{C}{L}$	$\frac{L}{H}$	$\frac{H}{L}$	$\frac{C}{L}$
1.0	1.0	1.0	1.0
2.0	1.5	1.33	4.0
3.0	2.0	1.5	9.0
4.0	2.5	1.6	16.0
5.0	3.0	1.67	25.0
6.0	3.5	1.71	36.0
7.0	4.0	1.75	49.0
8.0	4.5	1.78	64.0
9.0	5.0	1.8	81.0
10.0	5.5	1.82	100.0

for $Q_2 = Q_{out}$
with storage $Q_{out} \approx 15 \text{ cfs}$

$\approx 110 \text{ min} \pm$ inflow or 29 a-f: depth = 0.4' \pm
 $Q_{in} = 417.4$, $Q_{out} \approx 15 \text{ cfs}$

APPENDIX D
HYDROLOGIC AND HYDRAULIC COMPUTATIONS

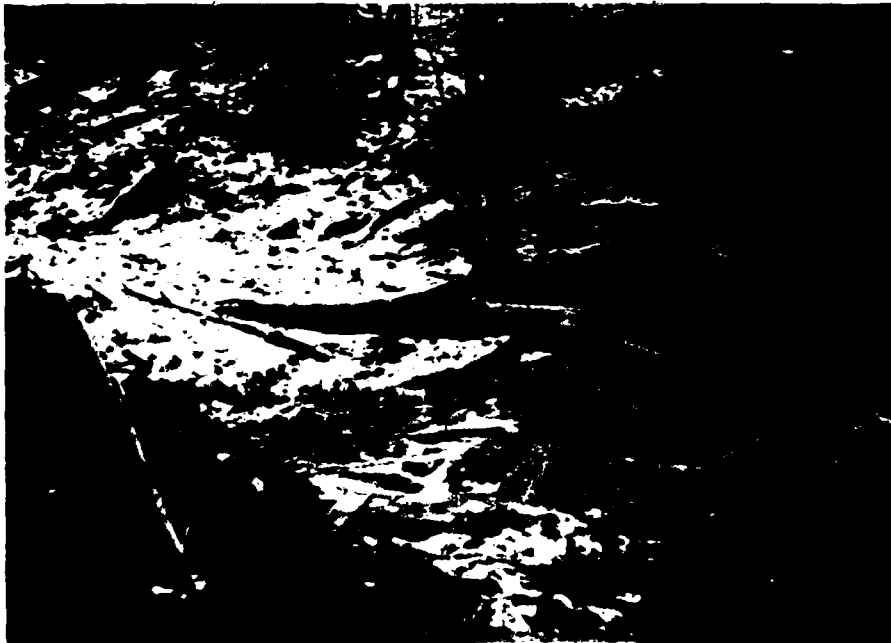


PHOTO NO. 9 - View of Upstream right abutment taken from
left abutment.

PHOTO NO. 8 - View of Upstream left abutment taken from
abutment. Note pile of debris.



PHOTO NO. 7 - View of Leverett Pond



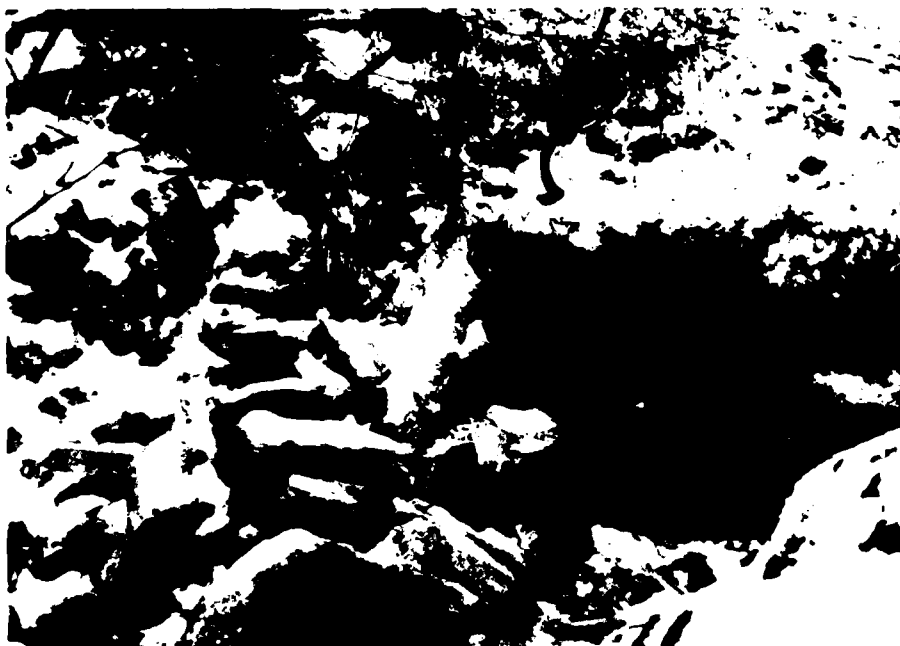


PHOTO NO. 5 - View of toppled dry stone masonry wall on the right side of the spillway chute.



PHOTO NO. 6 - View of downstream channel from a point about sixty feet from the dam.



PHOTO NO. 3 - Downstream channel as viewed from dam. Note remnants of dry stone masonry wall in foreground.

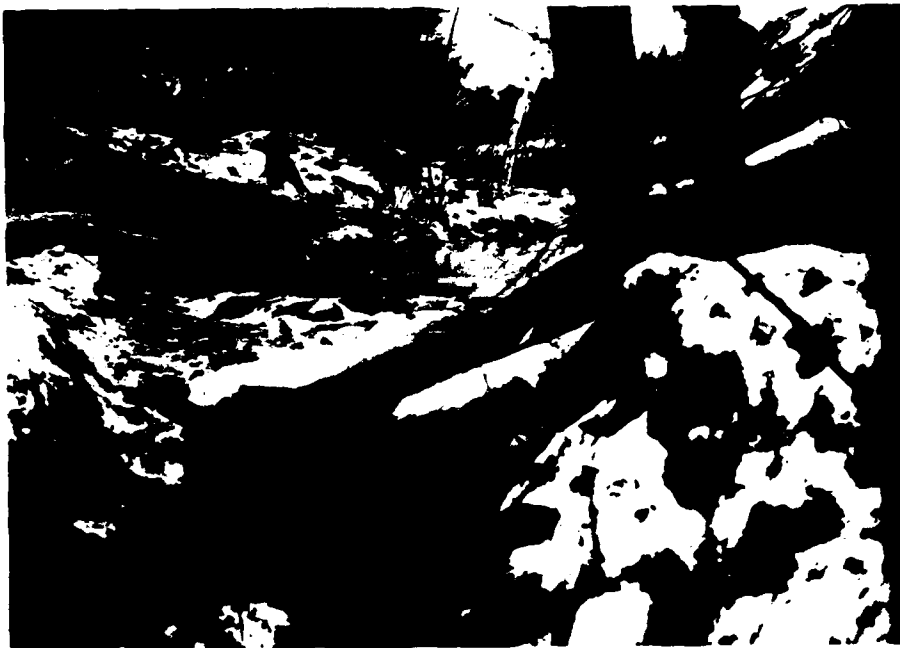


PHOTO NO. 4 - General view of dam from left abutment area.



PHOTO NO. 1 - View of dam from downstream channel. The two walls of the spillway chute are shown. Note debris in spillway chute. Scale is open to four feet.

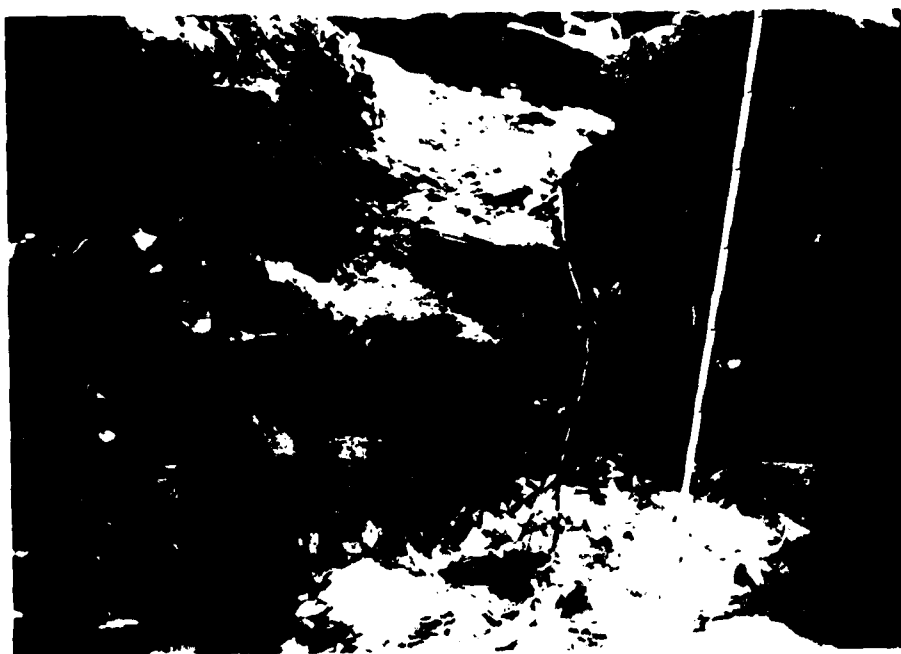
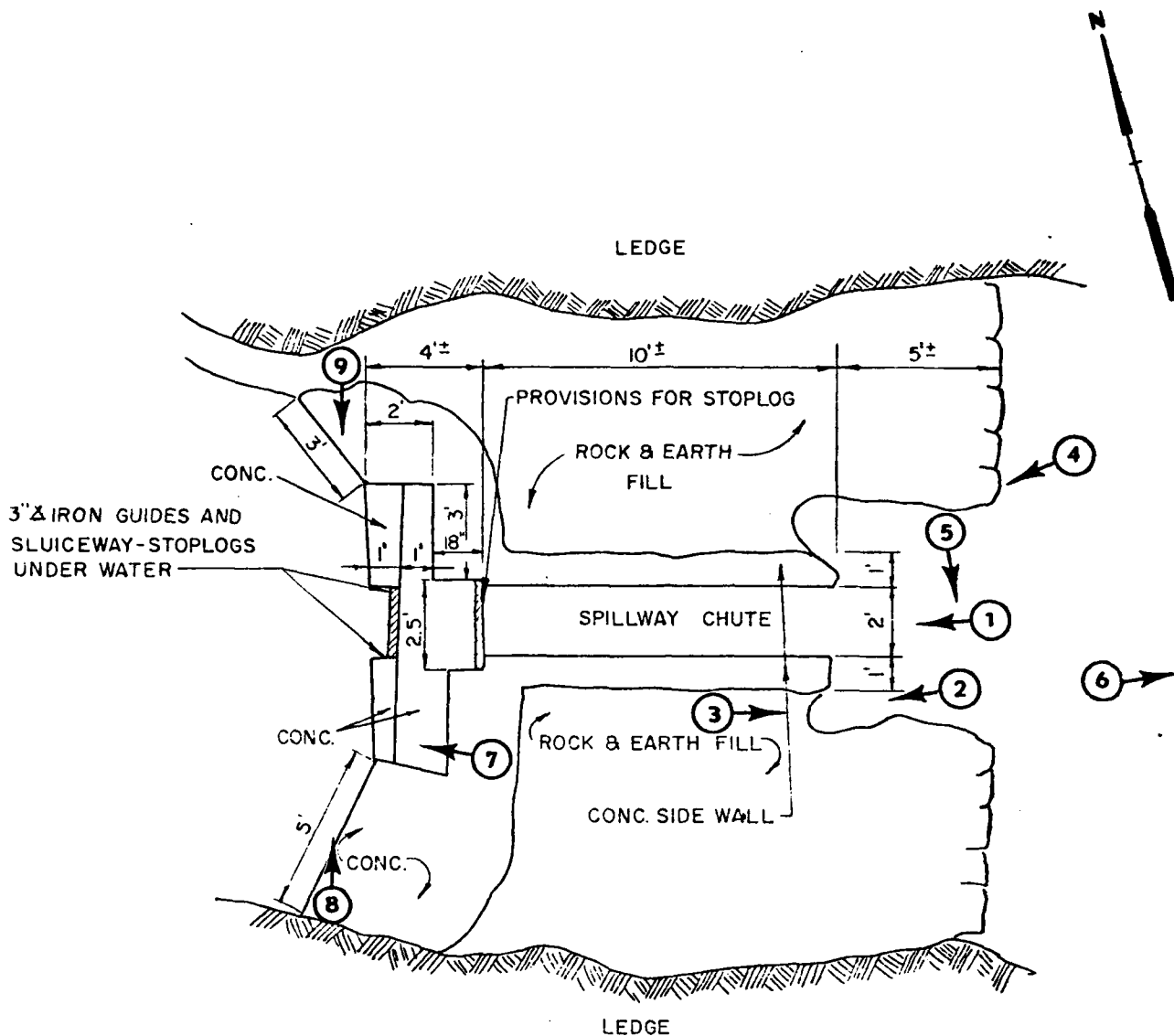


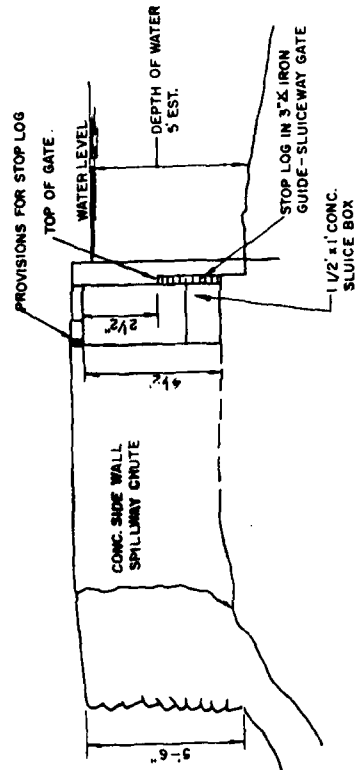
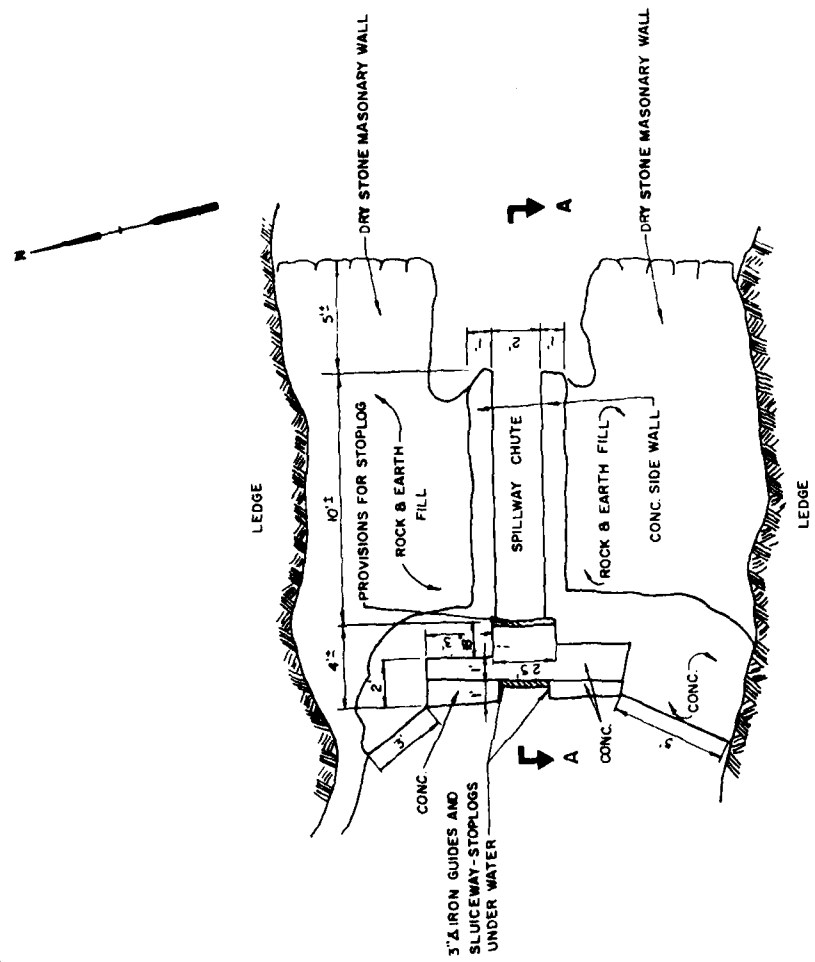
PHOTO NO. 2 - View of erosion next to right wall of spillway chute -- 3.5 feet of scale is visible.



PLAN

HAYDEN, HARDING & BUCHANAN, INC. CONSULTING ENGINEERS BOSTON, MASSACHUSETTS		U.S. ARMY ENGINEER DIV NEW ENGLAND CORPS OF ENGINEERS WALTHAM, MASS	
NATIONAL PROGRAM OF INSPECTION OF NON-FED. DAMS			
LOCATION OF PHOTOGRAPHS LEVERETT POND			
LEVERETT		MASSACHUSETTS	
		SCALE: NOT TO SCALE-DIMENSIONS EST.	
		DATE: FEBRUARY, 1979	

APPENDIX C
PHOTOGRAPHS



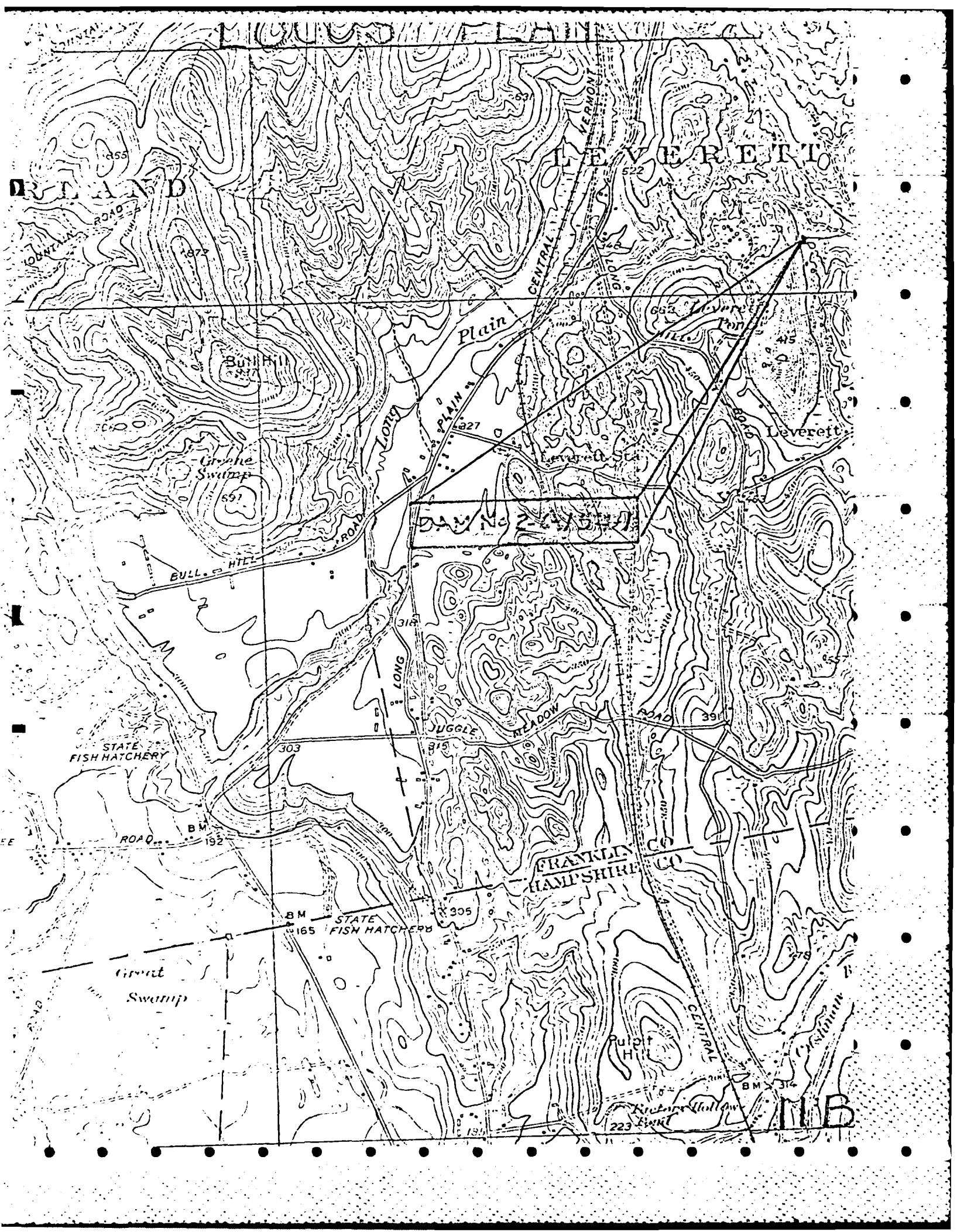
SECTION A-A

INFORMATION SHOWN TAKEN FROM
STATE INSPECTION REPORTS.

PLAN

MURDER, HARDING & BUCHANAN, INC.		U.S. ARMY ENGINEER DIV. NEW ENGLAND	
BOSTON, MASSACHUSETTS		CONTRACT NO. 100-1000	
BOSTON, MASSACHUSETTS		WALTHAM, MASS.	
NATIONAL PROGRAM OF INSPECTION OF NON-FED. DAMS			
LEVERETT		MASSACHUSETTS	
SCALE: NOT TO SCALE - ONE INCH = ONE HUNDRED FEET		DATE: FEBRUARY, 1973	

LEVERETT POND



DAM 110-2-6-134-1

LEYERETT POND

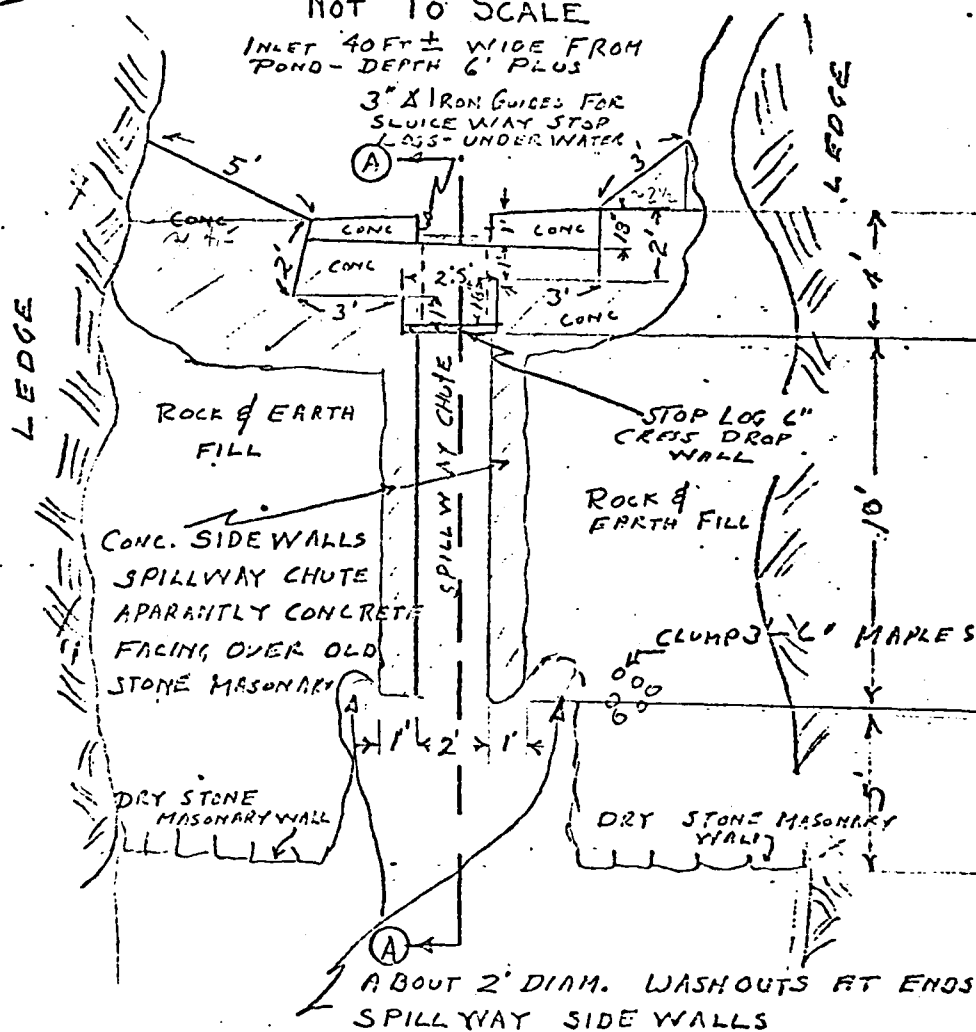
JUNE 15, 1972

SKETCHES

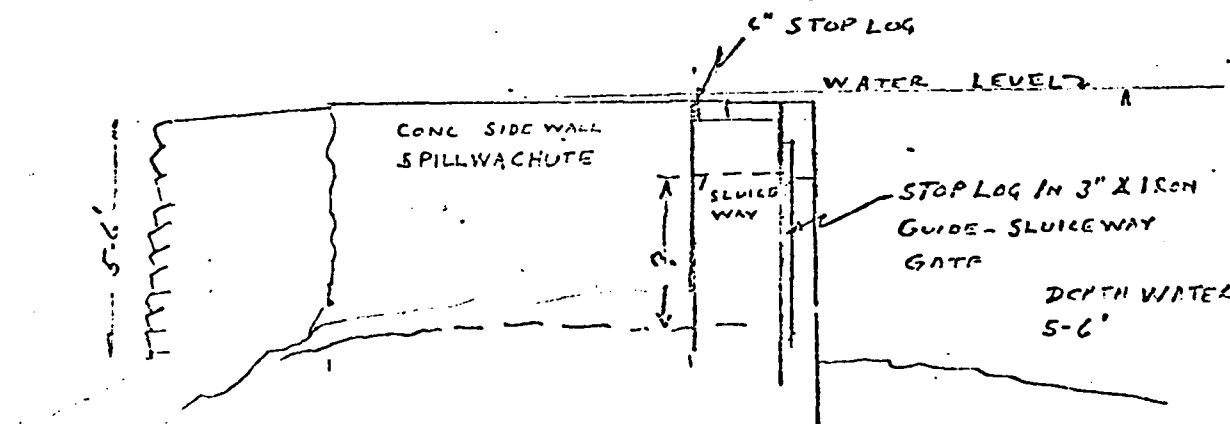
NOT TO SCALE

INLET 40 FT ± WIDE FROM POND - DEPTH 6' PLUS

3" X 1" IRON GUIDES FOR SLUICE WAY STOP LOGS - UNDER WATER



PLAN - NOT TO SCALE DIMENSIONS ESTIMATED



X-SECTION A-A - ALL DIMENSIONS ESTIMATED

8. Classification of Dam by Material:
- | | | |
|--------|---------------|-----------------------------------------------------|
| Earth | Conc. Masonry | Stone Masonry <u>X</u> |
| Timber | Rockfill | Other <u>Dry stone masonry faced with concrete.</u> |

- 9.
- A. Description of present land usage downstream of dam:
100 % rural; % urban
- B. Is there a storage area or flood plain downstream of dam which could accommodate the impoundment in the event of a complete dam failure. yes no X

10. Risk to life and property in event of complete failure.

No. of people 6 to 7

No. of homes 6 to 7

No. of businesses None found.

No. of industries -- Type None found

No. of utilities 2 each Type Pole lines. Electrical transmission line 1½ miles downstream.

Railroads None

Other dams Old stone dam remains about 2000 ft. below plus dams in Factory Hollow, Amherst.

Other --

11. Attach Sketch of dam to this form showing section and plan on 8½" x 11" sheet.

DESCRIPTION OF DAM

DISTRICT 2.Submitted by R. C. SallsDam No. 2-6-154-1Date June 15, 1972City/Town LeverettName of Dam Leverett Pond Dam
Also Beamon-Marvel Co., Dam No.Location: Topo Sheet No. 11BMass. Rect.
Coordinates N 534,000 E 325,700Provide $8\frac{1}{2}$ " x 11" in clear copy of topo map with location of
Dam clearly indicated.On Branch of Doolittle Brook, for access take private gravel roadway off
west side of Montague Rd. just north of church in Leverett Center (roadjust opposite I.C.) to end then walk along shore of pond about 1/3 mile throug
weeds.Year built: UnknownYear/s of subsequent repairs UnknownPurpose of Dam: Water Supply Recreational XIrrigation Other Former reservoir for Mill dam below.Drainage Area: 0.6 sq. mi. acres.Normal Ponding Area: 68 Acres; Ave. Depth 6 Ft. plusImpoundment: 133 Million gals; 408 acre ft.No. and type of dwellings located adjacent to pond or reservoir i.e. summer homes etc. 30 to 40 dwellings--about 10 of which are full-time homes.Dimensions of Dam: Length 15 Ft. Max. Height 8 Ft. - 10 ft.Freiboard NoneSlopes: Upstream Face VerticalDownstream Face VerticalWidth across top 17 Ft.

294.1
12/15/73
MA
DI 29179



HAYDEN, HARDING & BUCHANAN, INC.
CONSULTING ENGINEERS
BOSTON MASSACHUSETTS

SHEET NO. 2

JOB Dams
SUBJECT Leverett Pond
CLIENT Corps

Storage

	Flow	Area	Ave Area	Stor	Accum - Stor
	410	49.6 a	—	—	—
	412	64.1 a	56.9	114. d-f	114.
Top	417	100.35	82.3	411.	525.
	420	122.12 a	111.23	334.	859.
	421	134.12 [±] a	128.12	128.	987. d-f
	422.5	152.12 [±] a	143.12	215.	1202. "

1 1/2' x 1' outlet $A = 1.5'$ $WP = 5'$ $R = 0.3'$ $R = \frac{D}{4}$ $D = 1.2' 15"$

Elev.	H	4/10	CFs	IF 1 1/2' x 1' outlet were
410.9	5.4	4.5	15	functioning properly it could
411	5.0	4.0	14	handle flows shown at 1st.
411	3.0	2.4	10	It is adequate for 100yr storm
413	1.0	0.8	3	if pond level is lowered. Pond's
Flow	Analysis			stor capacity will retain inflow as
				outflow varies with water depth.

$$Q_{PF} = \frac{8}{27} (5.675) (6') (5')^{3/2} = 113 \text{ cfs}$$

$$WB = 0.4 (15) = 6$$

$$y = 10'$$

if $L = 15'$ $Q = \frac{8}{27} (5.675) (15) (5')^{3/2} \approx 282 \text{ cfs}$
For entire dam failure - catastrophic event

Flow from 257a drainage area to N-E, west of Montague Road - is towards Little Brook. (steep grade)

$$Q = 140' \times 3.21' \times 1.15' = 517 \text{ cfs add to}$$

Flow at base of Brook of Montague Rd

$$Q_T = 517 + 282 \approx 799 \text{ say } 800 \text{ cfs}$$

No. 75.244.1
2/26/78
ML
FDD



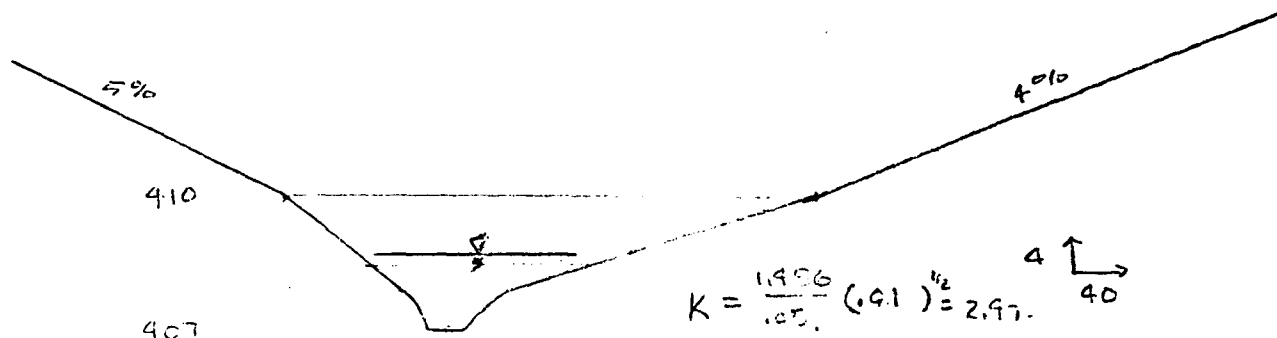
HAYDEN, HARDING & BUCHANAN, INC
 CONSULTING ENGINEERS
 BOSTON, MASSACHUSETTS

SHEET NO. 3
 JOB DAMS
 SUBJECT Leverett Pond
 CLIENT Corps

Sta 6+00

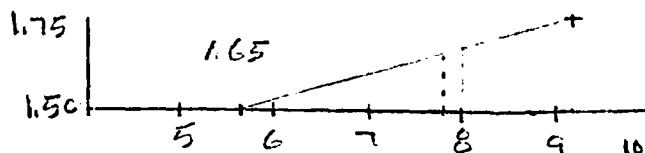
$$\frac{10'}{1100} = \frac{x}{100} \quad x = 0.9\% \text{ say } 1\%$$

elev 407±



<u>D</u>	<u>L</u>	<u>WP</u>	<u>R^{2/3}</u>	<u>K</u>	<u>V</u>	<u>Q</u>
3'	580 ft	125	2.8'	2.97	8.32	4826 cfs > 800
1.5	120 ft	60	1.59	"	4.75	567 cfs < "
1.75	170 ft	70	1.81	"	5.28	915 cfs ≈ 800

elev ≈ 408.65'



$$V_1 = \frac{600}{45560} \left(\frac{170 + 1500}{2} \right) = 11.5 \text{ a-f} < \frac{1}{2} \times 450 \text{ OK.}$$

$$Q_{P2} = 800 \left(1 - \frac{11.5}{450} \right) = 780 \text{ cfs} \quad El_2 = 408.62$$

$$V_2 = \frac{600}{45560} \left(\frac{1500 + 168}{2} \right) = 11.48 \text{ a-f}$$

$$\text{Avg } V = 11.49 \text{ a-f} \quad Q_{P3} = 800 \left(1 - \frac{11.49}{450} \right) = 780 \text{ cfs}$$

78,244.1

1/25/78

FDD

**HH
&B**HAYDEN, HARDING & BUCHANAN, INC.
CONSULTING ENGINEERS
BOSTON, MASSACHUSETTS

SHEET NO.

4

JOB

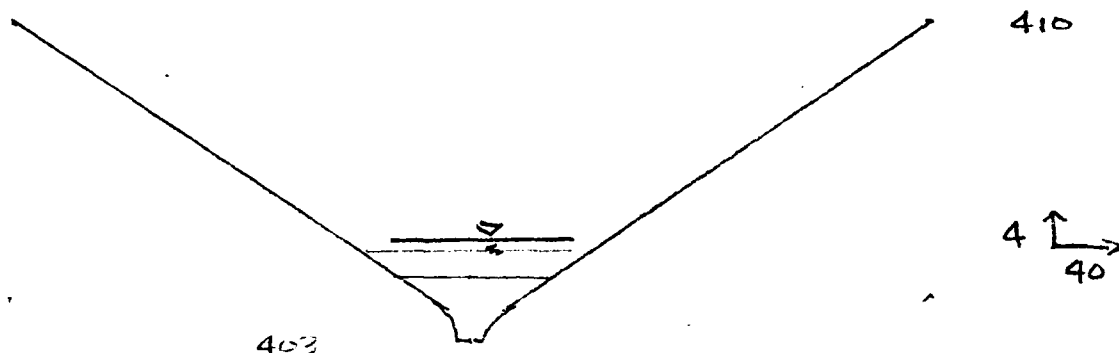
Dams

SUBJECT

Leicester Pond

CLIENT

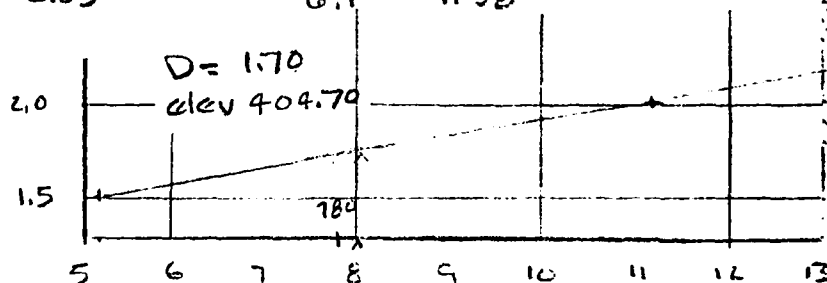
Corps

Sta 10+00

low flow ≈ 20 cfs
Flood flow ≈ 800 cfs

<u>D</u>	<u>A</u>	<u>WP</u>	<u>R^{2/3}</u>	<u>K</u>	<u>V</u>	<u>Q</u>
1.5	100	45	1.71	2.97	5.07	507 cfs
2.0	190	65	2.05	"	6.1	1158

A' = 130 sf



$$V_1 = \frac{400'}{43560} \left(\frac{168 + 130}{2} \right) = 1.9 \text{ a.f.}$$

$$Q_{P2} = 780 \left(1 - \frac{1.9}{4.0} \right) = 778 \quad \text{Let } Q_{Pa} = 778 \text{ cfs}$$

78.244.1
12/21/78
M/L
FDD



HAYDEN, HARDING & BUCHANAN, INC.
CONSULTING ENGINEERS
BOSTON, MASSACHUSETTS

SHEET NO. 5

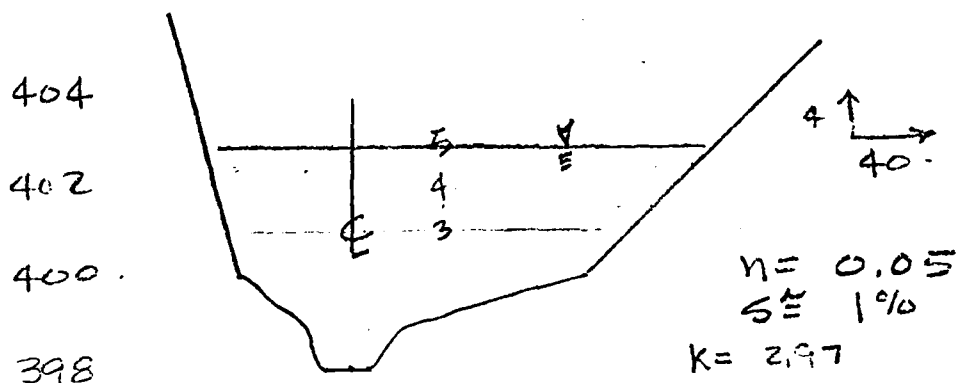
JOB Dams
SUBJECT Laurett
CLIENT Corps

500' Above Montague Rd.

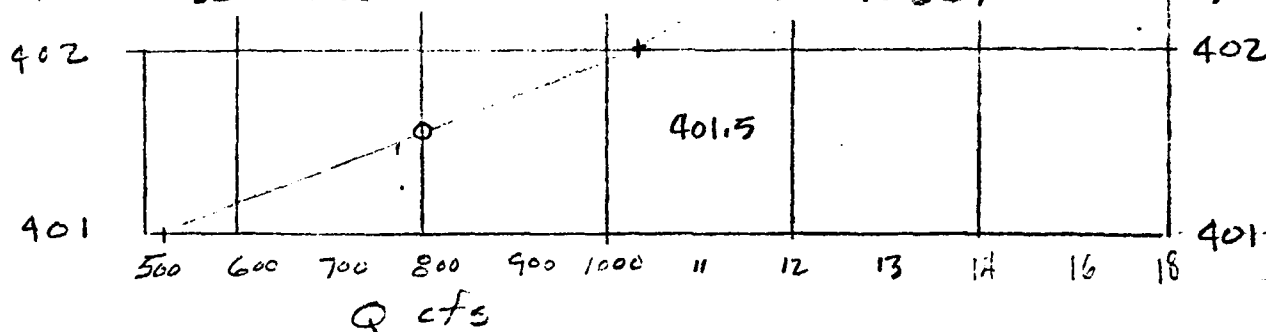
Sta 15+00

$Q = 778 \text{ cfs}$

Stream elev 398±



<u>D</u>	<u>WF</u>	<u>A</u>	<u>$R^{2/3}$</u>	<u>K</u>	<u>V</u>	<u>Q</u>
2	115'	148	1.18	2.97	3.51	520 ⁺ cfs
5'	155	343	1.7	"	5.1	1735
4	135	238	1.46	"	4.34	1032



$$V_1 = \frac{500}{43560} \left(\frac{130 + 700}{2} \right) = 4.75 \text{ a.f.}$$

$$Q_{P_2} = 778 \left(1 - \frac{4.75}{4.50} \right) \approx 770 \text{ cfs} \quad \text{Avg } V = 4.72$$

$$V_2 = \frac{500}{43560} \left(\frac{130 + 687}{2} \right) \approx 4.69 \text{ a.f.}$$

$$Q_{P_2} = 778 \left(1 - \frac{4.72}{4.50} \right) \approx 770 \text{ cfs}$$

8.244.1
10778
4
FDD



HAYDEN, HARDING & BUCHANAN, INC.
CONSULTING ENGINEERS
BOSTON, MASSACHUSETTS

SHEET NO. 6

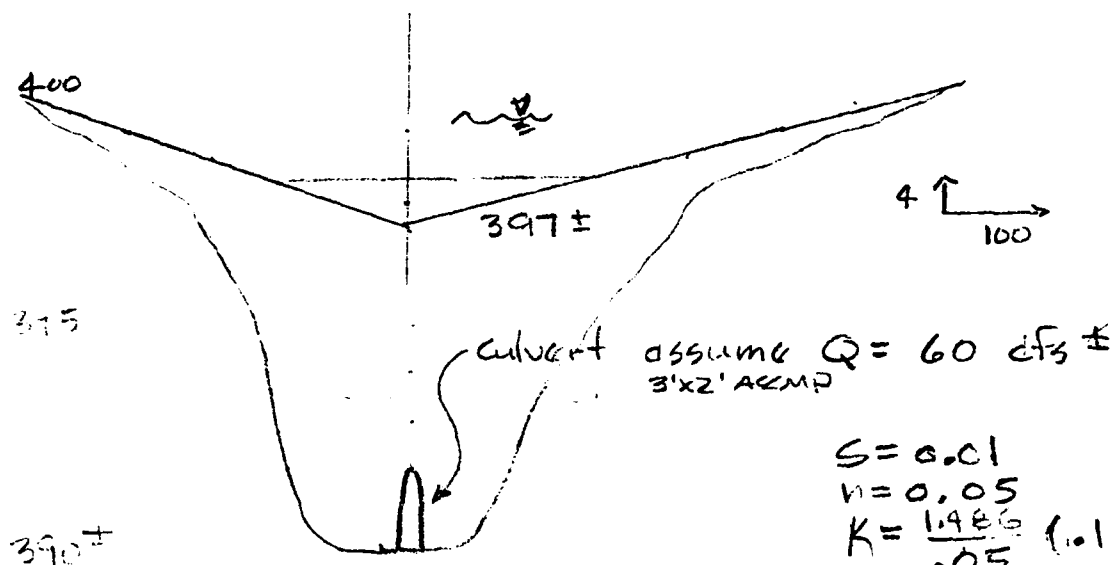
JOB Dams
SUBJECT Lawrence Pond
CLIENT Corps

Sta 20+00

Montague Rd.

$Q = 770$

$10' / 1100' \approx 1\%$ elev of stream ≈ 393

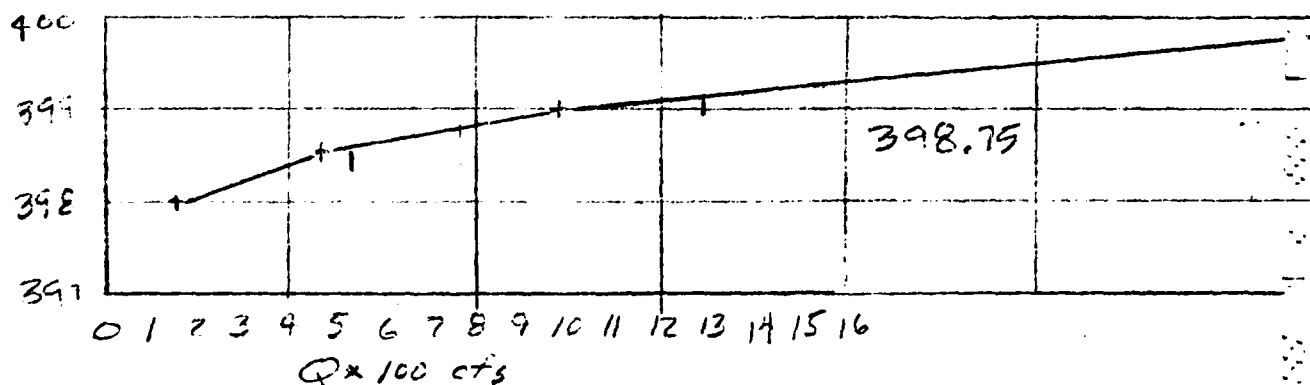


$$S = 0.01$$

$$n = 0.05$$

$$K = \frac{1.486}{0.05} (1.1) = 2.97$$

<u>L</u>	<u>A</u>	<u>WP</u>	<u>R</u> ^{2/3}	<u>K</u>	<u>V</u>	<u>Q</u>
1'	85	170	0.63	2.97	1.87	159 cfs
1.5	195	270	0.81	"	2.41	467
2'	345	370	0.95	"	2.82	973 cfs
3.0	765	520	1.30	"	3.85	12943



FDD



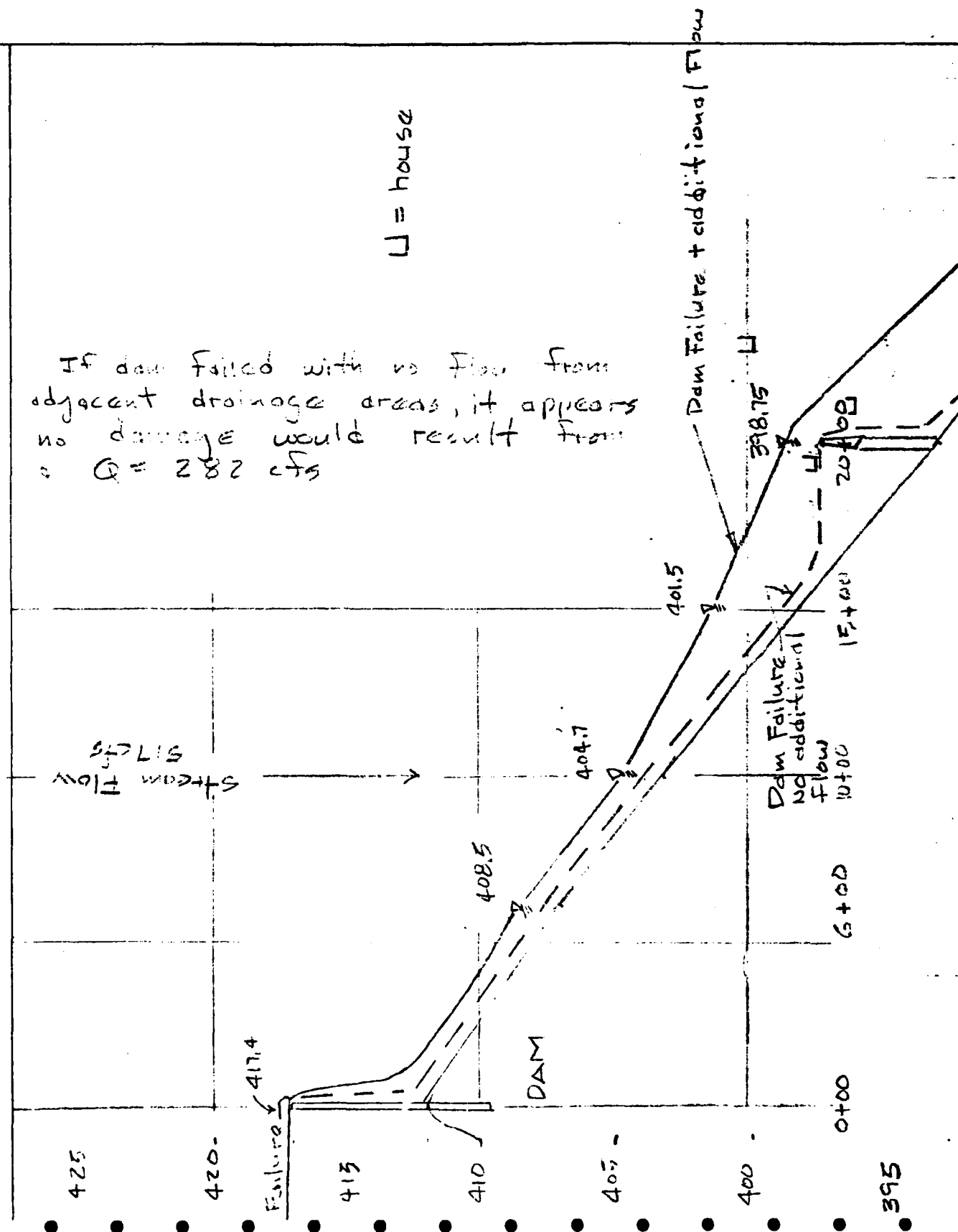
HAYDEN, HARDING & BUCHANAN, INC.
CONSULTING ENGINEERS
BOSTON, MASSACHUSETTS

SHEET NO. 1

JOE DeLuca

SUBJECT Le-10-0 + f

CLIENT CORPS



244
1/72
5
2



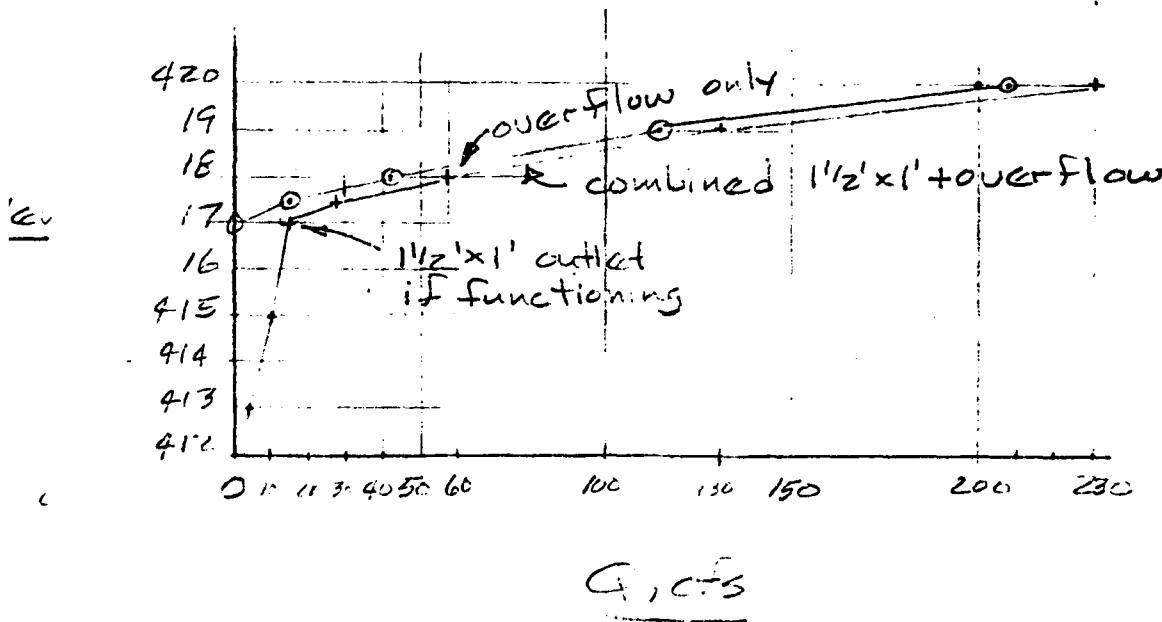
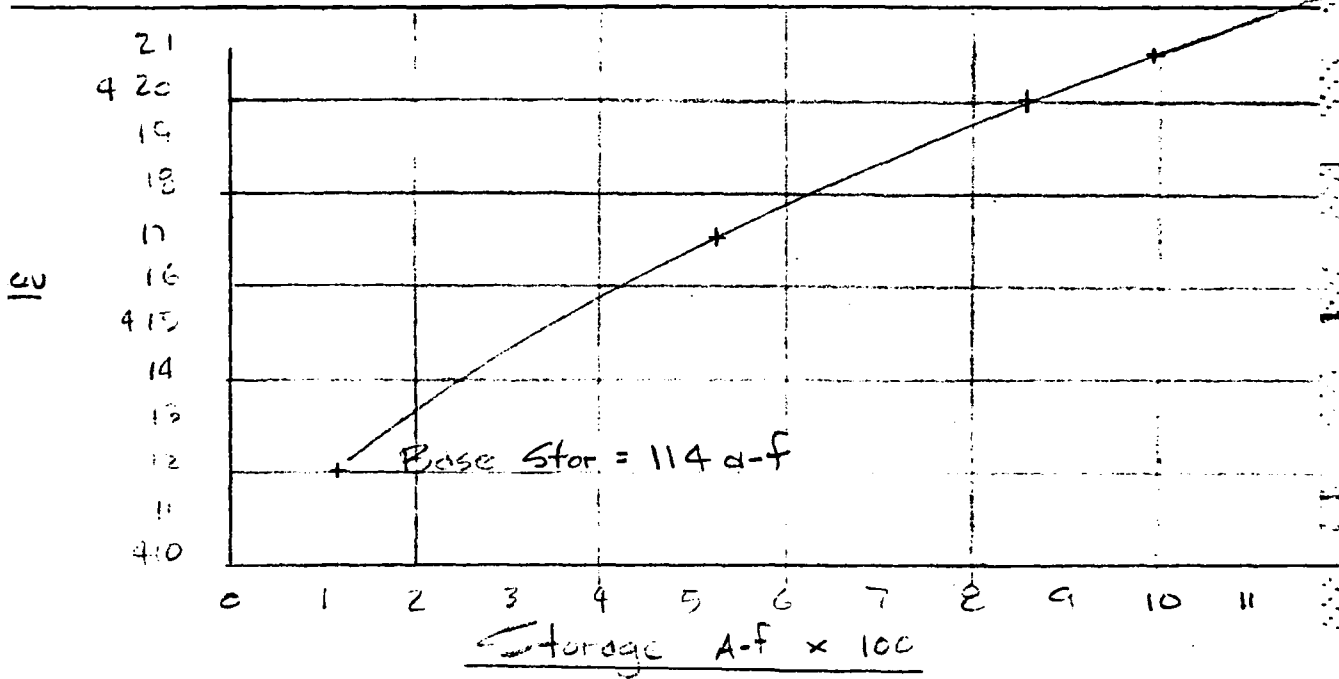
HAYDEN, HARDING & BUCHANAN, INC.
CONSULTING ENGINEERS
BOSTON, MASSACHUSETTS

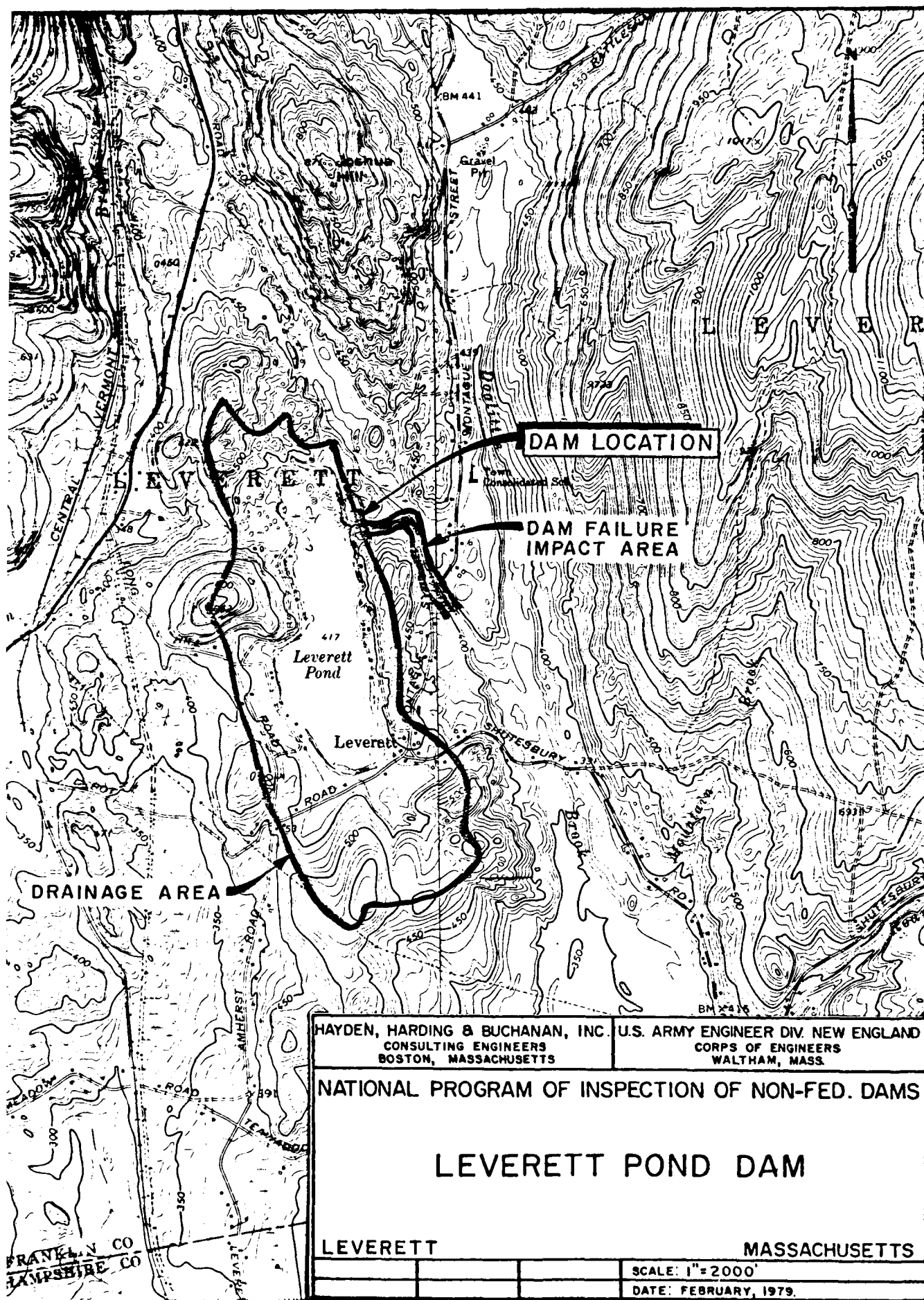
SHEET NO. 8

JOB Dams

SUBJECT Lavarett's Pond

CLIENT Corps





APPENDIX E

INFORMATION AS CONTAINED IN THE
NATIONAL INVENTORY OF DAMS

STATE	IDENTITY	DIVISION	CONCRETE	STATE	COUNTY	COUNTY	DATE	NAME	LATITUDE	LONGITUDE	REPORT DATE
MA	524	NED	MA 011 01	MA	011	01		LEVERETT POND DAM	4227.7	7250.3	23 FEB 79

POPULAR NAME	NAME OF IMPOUNDMENT
	LEVERETT POND

REGION/BASIN	RIVER OR STREAM	NEAREST DOWNSTREAM CITY - TOWN - VILLAGE	DIST FROM DAM (MI.)	POPULATION
01 0A	TH-DOOLITTLE HOOK	LEVERETT	0	1005

TYPE OF DAM	YEAR COMPLETED	PURPOSES	STRUCTURAL HEIGHT (FT.)	HYDRAULIC HEIGHT (FT.)	IMPOUNDING CAPACITIES (ACRE-FT.)	NORMAL (ACRE-FT.)	MAXIMUM (ACRE-FT.)
WEIR/CTPG	1900	R	7	6	525	525	525

SCS A VER/DATE
PRV/PED
OWN
DIST
NED
N
N
N
07MAR79

REMARKS

DIS HAS	SPILLWAY	MAXIMUM DISCHARGE (CFS)	VOLUME OF DAM (CY)	POWER CAPACITY (KW)	INSTALLED	PROPOSED	NO	LENGTH	WIDTH	DEPTH	LENGTH	WIDTH	DEPTH
1	15 C 2	330											

OWNER	ENGINEERING BY	CONSTRUCTION BY
LUCILLE LEWIS		

DESIGN	CONSTRUCTION	OPERATION	MAINTENANCE
NONE	NONE	NONE	NONE

INSPECTION BY	INSPECTION DATE	AUTHORITY FOR INSPECTION
HAYDEN HARDING + HUCHANAN, INC	27 NOV 78	PUBLIC LAW 92-367

REMARKS

END

FILMED

8-85

DTIC